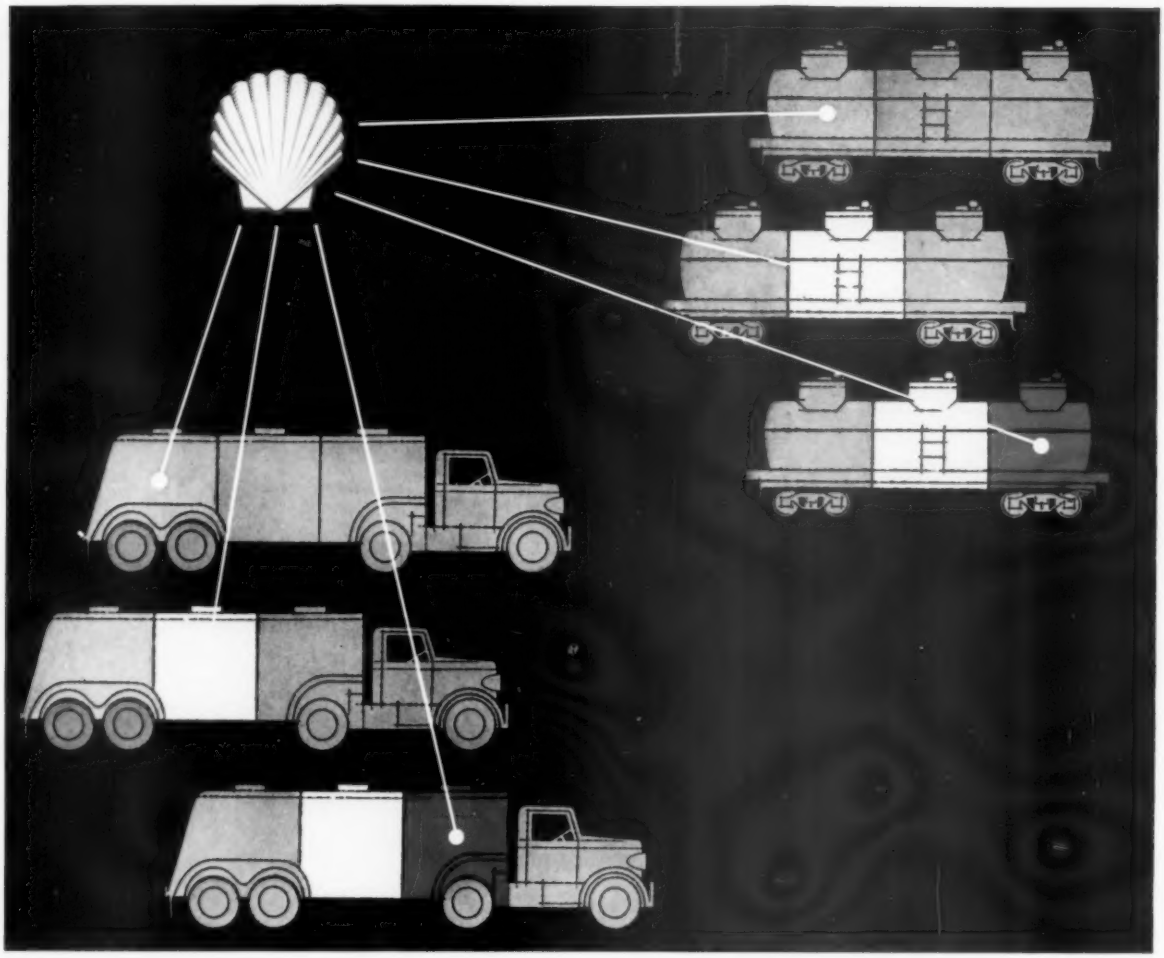
PETROLEUM WEEK

AUGUST 30, 1957

■ A McGRAW-HILL PUBLICATION

1958: Storm or lull in Washington? 9
Red propaganda theme: 'U.S. oil grab' 11
Antitrusters okay oil compact—so far 16
Unitization means new era for Rangely 19
Early secondary recovery can pay off 21
Start is near on second 4-Corners line 34
Well buyer shoots for 6-to-1 payout 36
Producers can help refiners cut costs 41
Arabian wildcat draws keen interest 45
Gasolines need emotion appeal, too 47
Gasoline picture varies by regions 52

Price 50 Cents



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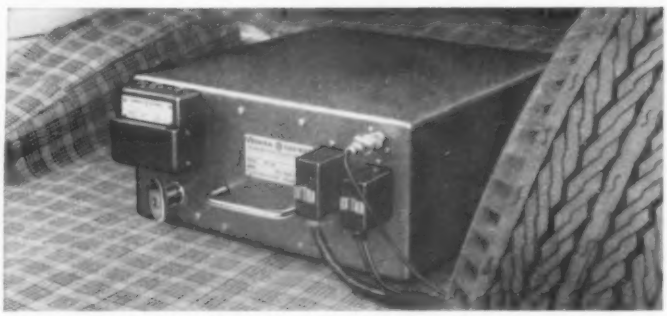

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60-Second Summary / WHAT'S HAPPENING IN OIL

AT-A-GLANCE PETROLEUM WEEK Copyright

August 30, 1957

dept/INDEX

Production	19
Transportation	34
Refining	41
Marketing	47
Washington	16
Statistics	51
The Market Trend	52
Key Prices	53
Editorial	56
International	44
Management	36
Personals	49
Service & Equipment	54

Some of oil's critics in Washington may simmer down, because this year's attacks mostly fizzled. A few bills backed by the industry may get passed next year, although it's hard to tell what Congress may do in an election year. . . . p. 9

•

Certain well-treating techniques cause refiners a lot of trouble, the findings of a research team reveal. Chlorinated solvents used to flush oilwells shorten the life of catalyst, upset product yield, and cause corrosion. . . . p. 41

•

You can rent facilities for research on the effects of radiation in petroleum processing. This is particularly advantageous for pilot plant work, or for small companies that can't afford to buy the expensive equipment. . . . p. 42

•

Herb Yocom, a veteran oil news writer and editor, died last week. His concept of the industry and of oil reporting has left a definite imprint —and blueprint. . . . pp. 10, 56

•

Finland's first refinery is using both Soviet crude and crude supplied by Western oil firms. Western companies will also share in distributing the products in Finland. . . . p. 44

•

The stepped-up Red propaganda campaign in the Middle East centers on oil. Its theme: The American aim is to drive out the British and French influence so that the U.S. can seize their oil. The theme is not new, but the intensity is. . . . p. 11

•

A Dallas firm expects a $40-million return on a $7-million cash outlay for production purchases. In two years, Producing Properties Inc. has acquired 17-million bbl. of crude reserves. It's banking on inflation to pyramid the investment. . . . p. 36

•

Construction is about to start on the second crude pipeline out of the Four Corners region. The line will run from the Aneth field to Jal, N. Mex., where it will tie in with an existing line to the Gulf Coast. Meanwhile, work is nearing completion on the line from Four Corners to California. . . . p. 34

•

A burst of activity is likely in Colorado's Rangely field, now that the state's largest field has been unitized. The unitization, climaxing 11 years of effort, may boost recovery by an additional 400-million bbl. . . . p. 19

•

An Aramco wildcat in western Saudi Arabia is being watched closely, particularly by U.S. and Japanese oil firms interested in acquiring oil rights in that area. . . . p. 45

Up to the Minute / SIGNIFICANT LATE NEWS

AT-A-GLANCE PETROLEUM WEEK

August 30, 1957

The first four oil import hearings will be Sept. 10-12. Capt. Matthew V. Carson, administrator of the new voluntary restriction program, says Indiana Standard will have an opportunity to protest its crude imports "quota" Sept. 10. Tidewater and Standard Oil Co. of Ohio will be heard Sept. 11, and International Refineries, Inc., Sept. 12. Hearings for others will be set after their formal requests are received.

Results of the hearings will be significant. If there are no adjustments to meet complaints, some companies may balk at going along with the voluntary program. If there are too many adjustments, the program could become ineffective.

•

U.S. shale oil reserves may be much greater than anyone had thought. A Bureau of Mines official at Laramie, Wyo., says a new study indicates that Colorado reserves alone may be almost 50% above the 1-trillion bbl. estimate made a year ago. For instance, one area formerly thought to have beds of high-grade oil shale 150 ft. to 200 ft. thick is now known to have beds 1,500 ft. to 2,000 ft. thick.

Shale oil is already being used as a fuel by a Colorado company. Union Carbide Nuclear Co. is burning 60,000 gal. a month at its Rifle, Colo., uranium-vanadium processing plant. The shale oil comes from Union Oil Co. of California's pilot plant, which has produced about 250,000 gal. since experimental operations began in March. Union, too, uses shale oil to fire boilers.

•

House investigators want the Air Force to go slow on using concrete instead of asphalt paving. A House Armed Services subcommittee is urging the Air Force to refrain from an "extensive" portland cement program for runways until results are known from tests of asphaltic paving being conducted by Army engineers.

•

Those closest to the gas bill are guardedly optimistic about its chances next year. Rep. Oren Harris (D., Ark.), author of the bill, met with representatives of several oil and gas companies this week to size up the outlook.

•

Plans for a natural gas pipeline from Alberta to California are progressing. Formation of a Canadian firm—Alberta and Southern Gas Co.—to buy Canadian gas reserves for the project was announced this week. However, Pacific Gas & Electric Co., which will build the 1,300-mi. line, still must get government clearances in Canada and the U.S. before actual construction can start.

•

Italy's oil agency apparently has decided there are times when it needs some American know-how. Ente Nazionale Idrocarburi is negotiating with a U.S. firm to do its exploratory work in Iran. This was confirmed in Rome after the Iranian Senate approved a 50-50 partnership agreement between ENI and National Iranian Oil Co. on three new exploration areas.

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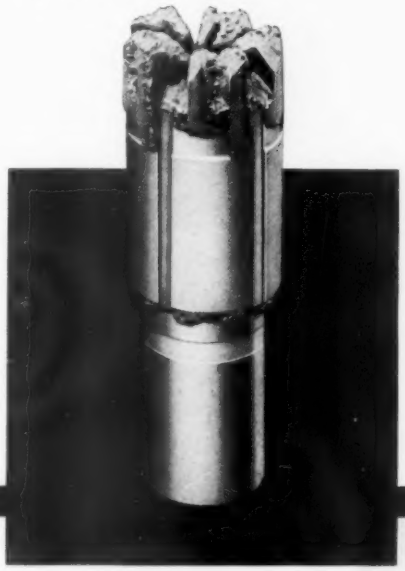
*Patents pending.



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Oil's Washington Outlook Better

- **Looking back, oil didn't fare badly in Congress this year. It didn't get a gas bill, but it wasn't hit with any crippling legislation, either.**
- **Looking ahead, oil may find a little smoother sailing. Several charges against it backfired, and oil wound up getting some praise on Capitol Hill.**

Although hostile congressmen aimed the usual quota of political left hooks at the oil industry this year, few hit the mark. And it looks as if the industry stands to win more than it loses in 1958.

In this first session, the 85th Congress has probably produced less legislation of all types—for better or worse—than any since the famous "do nothing" 80th Congress, as it was called by then-President Truman.

The explanation lies in the struggle for advantage between Democrats and Republicans, who are looking forward to the elections of 1958 and 1960.

Almost from the day Congress met last January, the two parties have been bogged down over civil rights and the President's record peacetime budget. Little legislation has been passed affecting the oil or any other industry.

One Washington oil spokesman sums it up this way: "We didn't get much of anything we wanted this year. But after all, we didn't get hurt much either."

The question mark now is 1958.

With both Democrats and Republicans anxious to make a record to carry to the voters, the logjam on legislative action may be broken next year.

Nevertheless, there is no sign that oilmen have anything special to fear from the next Congress—barring some new public opinion blackeye.

The industry is still a favorite target for lawmakers from outside the oil country. But the situation is better now than a year ago.

When Congress adjourned in 1956, the so-called gas lobby scandal—involving allegedly improper attempts to influence senators' votes on the natural gas bill—was still fresh in the minds of congressmen.

And when Congress reconvened last January, the industry quickly came under heavy criticism for "profiteering" on emergency oil shipments to Europe.

Several lawmakers, including Sen. Margaret Chase Smith (R., Me.), hinted darkly that federal price controls might be necessary. Two committees launched investigations.

Once the industry got around to telling its side of the story, however, the picture brightened.

The House Commerce Committee ended by praising oilmen for a job well done during the Suez crisis.

Sen. Joseph C. O'Mahoney, Wyoming Democrat who headed an oil lift investigation, was sharply critical of the international oil companies on antitrust and tax grounds. But there is little danger of legislation resulting from this inquiry—and no signs that O'Mahoney has succeeded in seriously arousing public opinion against the operations of oilmen abroad.

New hearings on the gas bill also failed to stir up the kind of controversy which existed in 1955 and 1956.

Natural gas legislation stacks up as the major item of left-over business for 1958. Enactment next year is doubtful.

The Harris-O'Hara bill, aimed at prohibiting public utility-type regulation of gas producers, was voted out by the House Commerce Committee, and cleared for floor action by the Rules Committee.

Although it may have had the votes for final House approval, a vote was put off until next year when Republican leaders refused to cooperate unless House Democrats could scare up 100 votes. They couldn't.

Some industry strategists, such as Russell Brown of the Independent Petroleum Assn. of America, are confident the bill can be enacted next year.

But most feel the political realities are against it. They point out that it is always difficult to get controversial legislation through both houses of Congress in an election year.

Percentage depletion, which came unscathed through one attack this year, will be hit again in 1958. But no change in the 27.5% provision is likely.

The senate voted down proposals by Sens. John Williams (R., Del.) and Paul Douglas (D., Ill.) to reduce oil and gas percentage depletion to 15% or 20%.

However, the attack is bound to be renewed when the House Ways and Means Committee opens hearing on general tax revisions early in January.

Special attention may be paid to the question of whether depletion should be allowed for overseas production, as it is now, and whether oil companies should be allowed offsetting deductions for taxes paid to nations abroad.

But changes in the law are unlikely so long as the Democratic leaders of both the House and Senate favor the depletion provision.

However, other changes in the tax laws are expected—mostly favorable to the oil industry.

The House already has passed a bill which would make clear that pipeline movement of products between units of a refinery are not subject to the excise tax. The same measure would allow refunds of excise taxes paid on gasoline destroyed by fire or other natural disaster—if the disaster is declared by the President.

Senate approval is expected in 1958.

There is also a possibility that Congress will vote a small reduction in the corporate income tax—say from 52% to 50%. Small businessmen may get an even better break.

Both House tax-writers and the Treasury Dept. are anxious to make it clear that sales of limited income rights to oil-producing properties—as distinct from outright sale of royalty rights—should be taxed as straight income rather than capital gain.

The proposed extension of the reciprocal Trade Agreements Act will become a battleground for oilmen if the new voluntary program to restrict oil imports fails.

Any attempt to write mandatory restraints into the law would come as

a proposed attempt to amend the trade act, which must be renewed next year.

Congress appeared ready to write some new chapters in antitrust and price discrimination law when it convened in January. Now, it looks like earlier fears won't materialize.

The Patman-Kefauver bill, aimed at limiting the supplier's right to meet his competitor's lower price without facing price discrimination charges, is bogged down in the Senate.

A bill which would require advance notice to the government on important mergers also has run into trouble in the House Rules Committee, and may never be enacted.

The oil industry may still get an uncomfortable time from congressional investigators.

Sen. Estes Kefauver's antitrust subcommittee is expected to take a swipe at the petroleum industry before his investigation of so-called administered, or non-competitive, pricing is completed, although the spotlight is on the steel and other industries.

Meanwhile, the House Antimonopoly subcommittee is cranking up for an investigation of oil pipelines' alleged violation of consent decrees prohibiting rebates to oil company shareholders.

A House Small Business subcommittee headed by Rep. James Roosevelt (D., Calif.) plans an investigation next year into the oversupply which it believes underlies gasoline price wars.

About the only piece of oil legislation that was passed this year by both houses is a bill shutting the military off from future grabs of oil-rich public lands.

The bill requires congressional approval of all military withdrawals of 5,000 acres or more of public lands—offshore or onshore.

However, the House and Senate passed slightly different versions. These differences must be ironed out before the measure can go to the White House.

Next year, Congress is expected to clear the way for more Alaskan oil development by applying the mineral leasing act to the territory's inland navigable waters, including bays and harbors.

Herb Yocom, Veteran Oil Editor, Dies

Herbert A. Yocom, first editor of PETROLEUM WEEK, and its consulting editor since December, 1956, died of cancer in St. Joseph's Hospital at Stamford, Conn., on August 23. He was 50.

Herb (no one who knew him or worked with him ever called him "Mister" after the first introduction) had been associated with the petroleum publications now published by McGraw-Hill Publishing Co. since 1943.

His career in petroleum editorial work began when he joined the former National Petroleum Publishing Co. as Washington editor for National Petroleum News and Platt's Oilgram News Service. While in the Washington office, he consistently improved the petroleum publications' coverage of the many news developments of significance to the industry taking place in the Capital. He authored a weekly Washington column for National Petroleum News for eight years.

In 1951 he moved to Cleveland, and was promoted to managing editor of NPN. He became editor in January, 1954, shortly after McGraw-Hill purchased the petroleum publications.

He was the first editor of PETROLEUM WEEK when this magazine was started in 1955, and even before that was editor-in-charge when the possibilities of developing the PETROLEUM WEEK concept of business reporting were being studied and tested. He edited the three pilot issues of the magazine that were published prior to the first regular issue July 8, 1955.

"Herb's death is a great loss, both to PETROLEUM WEEK and to the entire petroleum industry," said Harry Waddell, publisher of the McGraw-Hill petroleum publications.

"He was known, respected, and liked by the thousands of oil men, and was a dynamic factor in PETROLEUM WEEK's conception and growth."

He was one of the most articulate and persistent leaders in the plea for "integrated" oil men—men with broad understanding of the entire industry regardless of their individual segment or specialty. He wrote thousands of words on this issue in widely-quoted PETROLEUM WEEK editorials backed by 15 years of first-hand observations of the penalties paid by the industry because of its lack of enough of such "integrated" men.

Herb had been an active member of the working press ever since his graduation from the Columbia School of Journalism in 1929. At that time he joined the Associated Press as a member of its San Francisco bureau. He spent 12 years with the Associated Press (San Francisco, Reno, and Washington), and two years with the Petroleum Administration for War as assistant director of information.

He was a member of the National Press Club, Washington, D.C., and of Sigma Delta Chi, professional journalism fraternity.

He underwent a major operation in June, 1956, but returned to active participation on PETROLEUM WEEK's staff early this year as consulting editor—apparently well on the road to recovery. But since late spring he had been confined to his home. Even in recent months, however, he had continued to contribute to the magazine.

Born in Eureka, Calif., in 1907, Herb always referred to himself as a northern California "Yankee." He once wrote of his background: "Grandpa Yocom, a Kentuckian, was in the '49 gold rush, and Grandma was native born (Sutter County) in 1852."

Surviving are his wife, Florence A.; three sons, Robert, Richard, and Stephen; and a daughter, Judith Ann; his parents, Mr. and Mrs. Leonard Yocom, of Arcata, Calif.; and a sister, Mrs. Eleanor Johnson, of Santa Rosa, Calif.

PETROLEUM COMMENTS / By Wanda M. Jablonski

When the Bell Rings, Will Pavlov's Dog Bark?

The Soviet Union has launched what amounts, in effect, to a massive "brainwashing" drive in the Middle East.

Since early June, it has been pushing one of the biggest and most intensive propaganda campaigns yet witnessed in the Middle East. The theme: That the "real" purpose of American policy, and of the Eisenhower Doctrine, is to drive British and French influence out of the Middle East in order to seize their oil.

By dint of constant repetition, and by twisting every development—from Algeria to Oman—into another "example" of this American "oil imperialism," the Communists are conditioning people into automatic acceptance of this idea.

Like Pavlov's dog, the Arab is being systematically trained, at the mention of American policy, to respond automatically: "oil grab."

* * * *

This oil theme is not new. But the intensity of the present campaign is.

For nearly three months now, it has had No. 1, round-the-clock billing on Russian radios—particularly on Moscow's booming Arabic language broadcasts to the Middle East.

It is even being featured on Red satellite radios—from Peking to Czechoslovakia and East Germany.

Sample (Radio Moscow)—". . . the sympathies of the Soviet people are wholly on the side of the Arab tribes who are fighting for their freedom . . . The Oman Arabs are waging a struggle for their national independence in conditions of acute rivalry between the British and American oil monopolies for domination of the Arabian Peninsula . . ."

Sample (East German Radio)". . . The U.S., too, will incur the wrath of the peoples of the Middle East when its machinations are recognized for what they are and the Arab world realizes that the [Eisenhower Doctrine] is concerned not with aiding freedom movements but with brutal oil interests . . . Britain and America, hands off the oil wells of the Middle East!"

Sample (Czech Radio)—"The U.S. realizes that the (Oman) revolt is a welcome opportunity to apply the old tactic, to use anti-British national sentiments for advancing U.S. oil interests . . . yet the Arab people are not inclined to exchange British for American domination . . ."

Sample (Radio Peking)—". . . the current Oman situation is a bloody episode in the oil war between Britain and the U.S. . . ."

And so on, day in, and day out—as many as 15 to 20 broadcasts a day.

* * * *

It would be foolhardy to laugh off this propaganda campaign just because it's a lot of nonsense factually.

The situation in the Middle East is critical.

The recent pro-Soviet coup in Syria has put Moscow-led Communists astride the giant Middle East oil pipelines from Iraq and Saudi Arabia to the Mediterranean (all of which pass through Syria).

For some time, it has been clear that Moscow's first aim has been to secure a stranglehold on key points in the West's vital oil communications arteries—oil on which the economies of Europe, and much of the free world, so crucially depend.

Egypt, which controls the Suez Canal entrance to the Red Sea, has already been armed by the Soviets. So has Yemen, at the other end of this Red Sea oil lane. And now comes the Communist and Egyptian support for the uprising in Oman—at the entrance to the vital Persian Gulf oil fields themselves.

* * * *

The "oil war" propaganda campaign fits in with all this neatly—too neatly. Its purpose: to discredit American, as well as all Western policy in the remaining Arab lands by tainting all our moves with "ulterior" motives.

Obviously, Moscow doesn't want America's position strengthened in the Middle East any more than the British position.

Why is America not backing the French in Algeria? Not because of U.S. disapproval of the use of force, as Washington claims. The "real motive," (didn't you know?) is to replace French influence because of the Sahara oil.

How about Washington's stand against the British-French-Israeli Suez invasion last winter? Why, merely American oil intrigue to weaken the British and French.

In other words, the Arabs are being conditioned to conclude: "A plague on both your houses. It's all just rivalry between two imperialists—the old (Britain and France) and the new (America)—over our oil. The Soviet Union, on the other hand, has no ulterior motives. See, it has no companies seeking Middle East oil concessions. Therefore, its only desire is to help the Arabs get rid of both groups of imperialists."

* * * *

Not only is this oil rivalry theme a neat way to try to discredit Western policy in Arab eyes, but it also fits in with another long-standing Soviet objective: to break up the Western alliance.

The Soviets had a field day during the Anglo-American break over the Suez crisis. Recently, Washington and London have been coming closer together again.

By stressing American "machinations" to oust the British from their Middle East oil position, Moscow is touching a tender point with many Britishers.

The extremist anti-American sections of the British press (though not the more responsible papers) for years have been seeing a Texas oil man behind every British sand dune in the Middle East. Exemplified by Beaver-

brook's old-empire "Daily Express," this group has been blaming all Britain's Middle East troubles—from their Iranian oil nationalization of 1951, and Britain's ouster from Egypt and Jordan, to the latest Oman uprising—to "American oil intriguers."

Ironically, these British papers today are providing Moscow with the best grist for its propaganda mill. Almost every single Communist broadcast is careful to quote British papers as authenticating the oil rivalry theme.

"As the British Sunday Express was compelled to admit, Britain and U.S. are struggling for oil . . . " crows Radio Moscow. Echoes Peking: ". . . as the British press has said, the current situation in Oman is a bloody oil war . . ."

* * * *

This Moscow line is being further boosted in the Middle East by both Damascus and Cairo.

Cairo has taken over the Soviet line so completely, in fact, and is using so many familiar Soviet propaganda phrasing ("freedom-loving peoples," etc.) so systematically, that one can only conclude they either are using actual Soviet texts, or have a group of Soviet propaganda technicians guiding them.

Sample recent Cairo broadcast: ". . . the two thieves (America and Britain) conspire with the hope of milking dry Arab oil resources for the benefit of Western imperialism, both the old and the new. Meanwhile, they conspire against one another to gain the largest share of the loot. All this will be of no avail to the two thieves . . . Arab oil will become the possession of the Arab peoples alone."

* * * *

One side-light on the present Soviet propaganda campaign is that it was launched, full force over the air waves, several weeks before the Oman uprising—a development which was promptly used then as the No. 1 current example of "Anglo-American oil rivalry." Was this pure coincidence? Or was the campaign started, with prior knowledge, to lay the groundwork of public opinion?

Interestingly, the Soviets are not concentrating their Middle East oil propaganda campaign just in the Middle East alone. It is also being beamed on their world-wide radio circuits, especially to Europe, Asia, and the Far East.

Significantly, the theme is also being given top billing on home broadcasts in Russia, and in the satellite countries.

Could it be that Moscow is preparing the groundwork of public opinion, both at home, and in Europe and Asia, for future action of some kind?

Senate Group Disagrees on Oil

The Senate Antitrust subcommittee came up with widely varying views on the oil industry as a result of a lengthy investigation earlier this year. The subcommittee's findings were issued this week. They consisted of a "majority" report by three members, and dissenting views by two others.

Sen. Joseph C. O'Mahoney (D., Wyo.), subcommittee acting chairman, directed the major blows at the industry. His report was signed by Sen. Estes Kefauver (D., Tenn.), and Sen. Matthew Neely (D., W. Va.).

O'Mahoney claimed, for example, that the trend of the domestic industry is toward a "cartelized nature."

He also hit at the recommendation of a Cabinet committee to restrict oil imports through voluntary agreement. This, he said, is anticompetitive and tends to preserve the market position of the international oil firms.

He said an imports duty would be better than voluntary restrictions.

The report was also critical of the formation and operation of the government's plan of action under which the Middle East Emergency Committee was established. Among other things, O'Mahoney charged that records show increases in first-quarter 1957 profits over 1956 profits by the five principal companies on MEEC. He said this included "profits made possible only because of immunities granted under MEEC schedules."

O'Mahoney proposed that government agencies devise new methods for handling any future oil emergencies through government—not industry—organization.

Other recommendations of O'Mahoney and his two co-signers included:

- That the 27.5% depletion provision be limited to production within the U.S. and its territories.
- That an investigation of pipelines be made. This would include a study of charges that there is a monopolization of common-carrier pipeline transportation.

Sen. Everett Dirksen (R., Ill.), a member of the Senate subcommittee, sharply challenged virtually all of O'Mahoney's report.

He said the record does not support the charge that the integrated companies "dominate, prevent, or have the power to destroy the operations of independent refiners and producers."

He termed MEEC as the only logical solution to the Suez crisis, and termed the oil lift a success.

Sen. Alexander Wiley (R., Wis.) steered between O'Mahoney and Dirksen. He said he couldn't agree with the "extreme" criticism by O'Mahoney of the oil lift, nor could he subscribe to the "complete exoneration" of the oil firms by Dirksen.

Meanwhile, last week the Interior Dept. released its own report on the MEEC operation during the Suez crisis. The conclusion: that the plan of action was the "only way" to meet such an emergency.

Deep in Oklahoma

Magnolia Petroleum Co.'s No. 1 Sterba-Ordivician has broken Oklahoma deep-drilling records.

The well had been drilled to 19,744 ft. by last weekend. The projected depth is 20,000 ft.

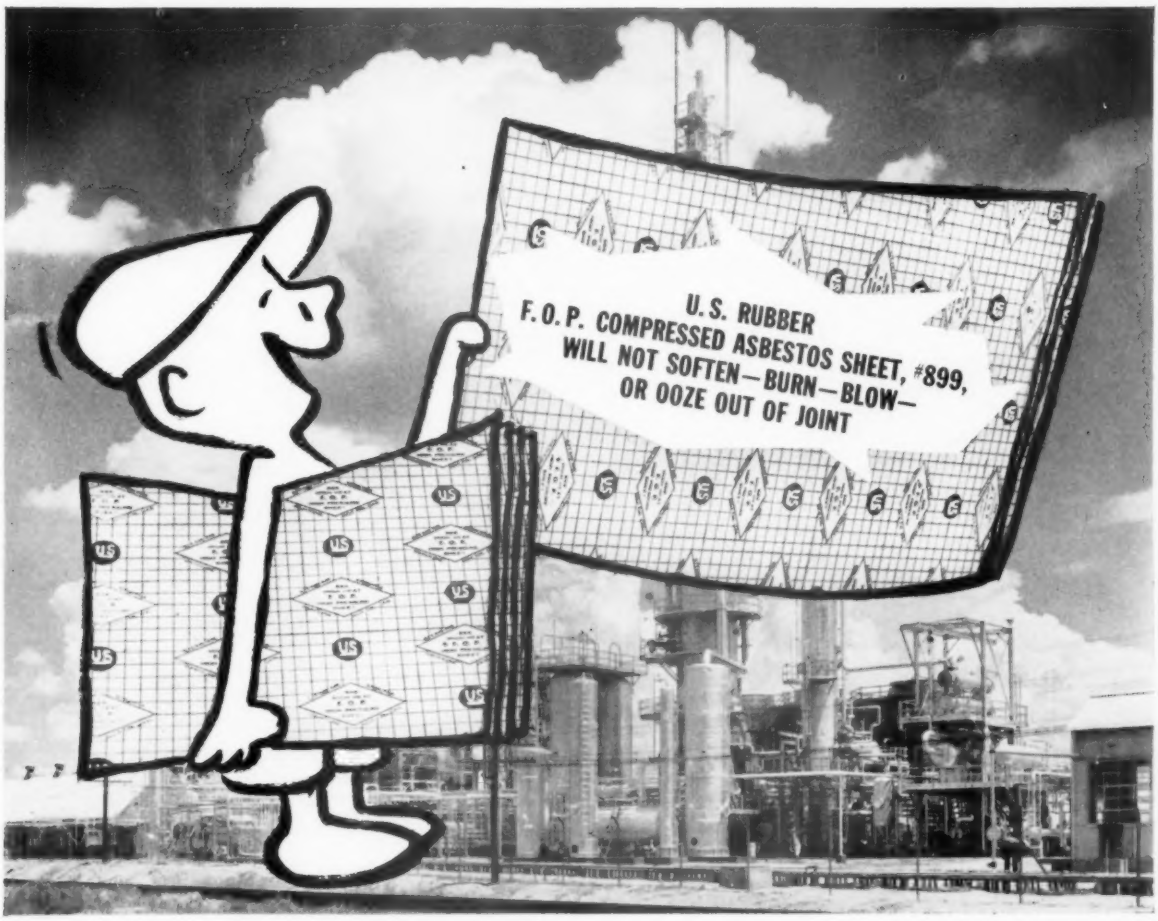
The deep test, in Caddo County, is pushing down through shale for more than three and one-half miles. It has 5,100 ft. of open hole, but this has created no special problems.

A part-interest project, the well is being drilled by Big Chief Drilling Co., of Tulsa, Okla.

Carl's Studios, of Chickasha, Okla., took the striking picture.

PACKING

HOT NEWS for Hot Joints and Flanges



This is the packing that's making headlines where the going's the hottest... where flanges or joints must be packed against superheated or saturated steam, air, water, ammonia, gases, oil, gasoline and many chemicals.

U. S. Compressed Asbestos Sheet Packing was the first of its type developed particularly for refineries and chemical plants. It is made by a special process from selected long-fibre asbestos and bonded with exacting combinations of heat-resistant materials. Balanced construction makes this packing ideal for use as Still Head Gaskets.

U. S. Rubber Compressed Asbestos Sheet Packing can be furnished in a variety of constructions, each specially suited to a specific requirement. They are some of the hundreds of styles of U. S. Rubber Packing available at any of the 28 "U. S." District Offices, at selected distributors, or by writing us at Rockefeller Center, New York 20, N. Y. In Canada, Dominion Rubber Co., Ltd.

Mechanical Goods Division

United States Rubber

See things you never saw before. Visit U. S. Rubber's new Exhibit Hall, Rockefeller Center, N.Y.

What's New / IN THE INDUSTRY

Stancal Using 'Brain' As New Research Tool

Standard Oil Co. of California last week moved a big step closer to the ultimate payout in electronics in unveiling its new giant IBM 704 computer. The machine will be used as a research tool. It will have no clerical or accounting functions.

The IBM 704, first to be delivered to the oil industry, is a digital-type computer similar in some respects to the IBM 705 already being used by Esso Standard, Indiana Standard, and Ohio Standard.

The company feels the machine will more than pay for itself in researching problems in production, refining, transportation, and marketing. Among the targets are:

- More efficient oil field production, using information on underground reservoirs.
- Compilation of a rate of return on the outstanding investment in an exploratory prospect.
- Raw material stock problems in manufacturing, as related to supply and demand, and future possibilities of profit or loss.
- Forecasting of product demand and specifications, to guide research and product development.
- Analysis of the results of product testing, to increase both quality and output.

In a pilot program to determine the best use of refinery stocks, the computer offered 90 solutions—each resulting in a higher return on the refinery run.

•

Independents Map Fight On Purchaser Proration

Four Texas independent oil producer associations are mapping a fight against purchaser proration of crude oil.

Representatives of the four groups met in Ft. Worth last week to decide what to do to combat "the damaging refusal of some major purchasing companies to accept allowable production."

They set two basic objectives:

- To require all common purchasers of crude to buy ratably all oil tendered along pipelines where the pipelines now buy. The aim is to prevent a company from taking a full allowable in a field where it has production, while buying below the allowable where it is not a producer.
- To require common purchasers and their affiliates to cut their own production statewide in the same proportion below allowables that they or their affiliates cut purchases from other producers below the allowables of those producers.

•

It doesn't appear likely that Sun Oil Co.—or anyone—will be given specific antitrust immunity as a condition for participation in the voluntary program to restrict crude imports. Sun has cited possible antitrust action as its reason for being reluctant to join formally in the imports control program without special antitrust exemption.

The Justice Dept. has limited its commitments to approval of Cabinet Committee recommendations for the Interior Dept. to deal individually with importers in attempting to hold imports to an average of 1,031,000 b/d. It is not expected to go any further.

Some attorneys say the real danger in the program might lie in private suits, rather than possible government antitrust action in the future. This could stem, they say, from failure of an importer to meet terms of a supply contract as a result of abiding by the voluntary restriction program.

•

The Canadian Petroleum Assn. is pressing for a change in Canada's oil depletion provision. The aim: to give Canadian firms a better competitive position.

The association has recommended to the Canadian government that the depletion provision be set at 25% of an exploration company's share in the gross proceeds of its production of oil and gas. The present provision is 33⅓% of net income.

The association says the change would "equalize" the competitive position of Canadians, "without inhibiting the flow of foreign capital."

•

Humble Oil & Refining Co. is getting an "outsider's view" on its operations from 44 educators who have been working for the company on special projects, from exploration and production to advertising and public relations.

Earlier, Continental Oil Co. said it had a group of college administrators studying its methods in order to make suggestions (picture, below).

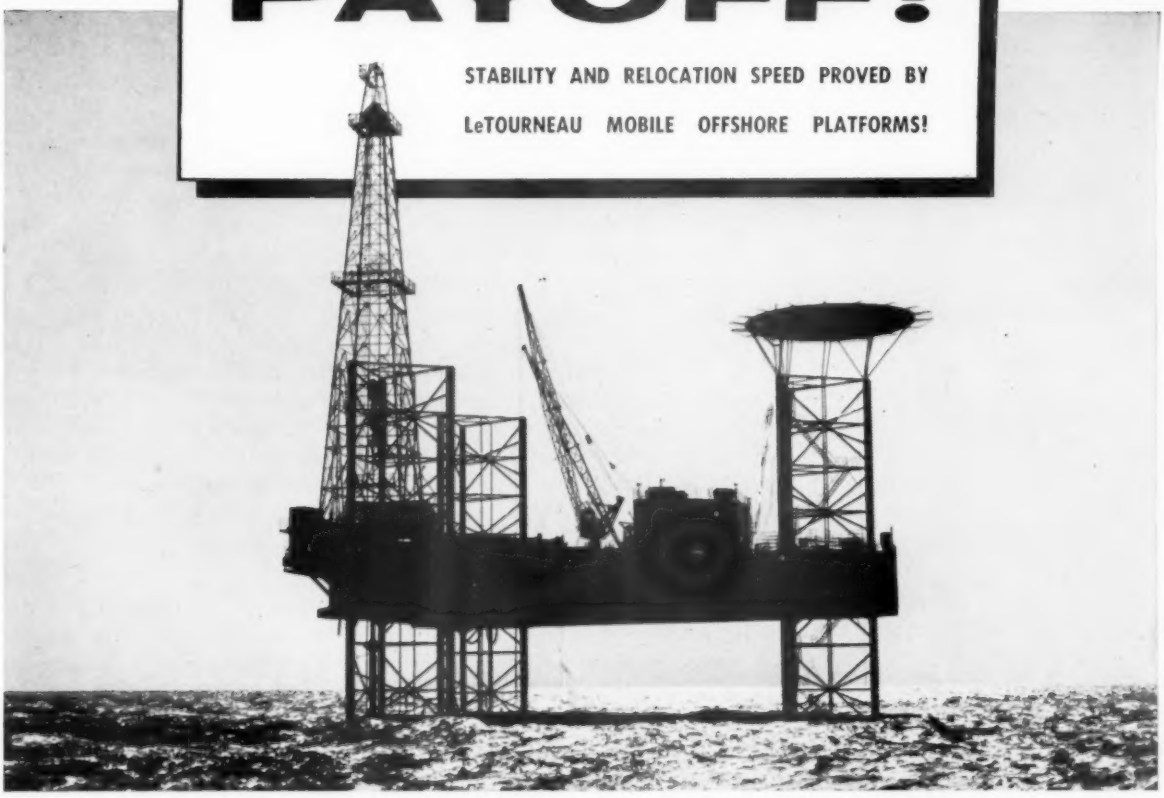
Profs Give Oil Firm an Examination

Ten top college administrators (who are also corporation consultants) are in the process of "grading" the operations of Continental Oil Co. after a two-week tour, they are presenting their findings and recommendations.

In the session shown above, covering exploration activities, are, left to right, Dr. Truman H. Kuhn, Colorado School of Mines; Prof. Paul Holden, Stanford University; Dr. Carey Croneis, Rice Institute; W. C. Stout, manager of Conoco's land section; and J. A. Culbertson, manager of Conoco's exploration department.

PAYOFF!

STABILITY AND RELOCATION SPEED PROVED BY LeTOURNEAU MOBILE OFFSHORE PLATFORMS!



Two great money-saving capabilities have just been demonstrated by LeTourneau Platforms in the Gulf.

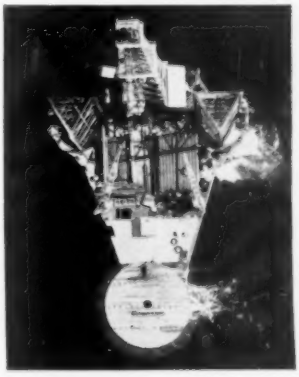
●

Record breaking time for relocation was set by Zapata Offshore Company's "Scorpion," on location off the South Pass of the Mississippi. It was lowered to water, towed one mile to new location, and raised again to 25 feet in just 8½ hours!

Proof of real stability was established by the "Vinegarroon," also owned by Zapata, when it weathered Hurricane Audrey with virtually no damage. Directly in the path of the storm off Cameron, La., the big unit was able to resume operations within hours after a crew could return aboard — becoming first in the area to go back to work.

This is real performance, and these LeTourneau-designed and built platforms will be joined soon by others under construction for such firms as Deepwater Exploration Co., Barnwell Offshore, Inc., Dixilyn Drilling Corporation and Reading & Bates Drilling Co.

Others will be built to meet exact requirements of forward looking companies like yours. Why not summarize your requirements and let us discuss them in confidence with you? Delivery in five to eight months.



Zapata Offshore Co.'s Vinegarroon . . . capable of operating in water 100 feet in depth and drilling to 20,000 feet.

LET
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Looking Ahead in Washington

McGraw-Hill
Washington
Bureau
August 30, 1957

The oil compact is safe from attack by the antitrusters—for now. Congress has instructed the attorney general to make periodic reports on whether the Interstate Oil Compact is used for price-fixing or other monopolistic purposes. The Justice Dept., in a new report due soon, still has no complaints about how state oil conservation laws are carried out. Asst. Attorney General Victor Hansen says the investigation will continue, within tight budget limitations.

A consent settlement in the "oil cartel" case is being talked up again. The Justice Dept. has been exploring the possibility of a settlement with lawyers for the five major companies accused of illegally acting as a cartel in overseas operations. Earlier settlement talks broke down, but top antitrusters are hopeful an agreement can be reached this time. But three of the companies are described as very dubious, however. The reason for the companies' reluctance is this: Although a consent settlement doesn't constitute an admission of guilt to antitrust charges, industry critics would probably construe it that way.

•

There's formidable opposition in the House to new trade restraints. That was obvious from the flat refusal of a House committee to approve a White House request for new tariffs on lead and zinc imports. It demonstrates that any such move by domestic oil producers would face trouble.

•

MPSA is accused of reluctance to help small refiners. The military oil-buying agency had to be pushed into abandoning its policy that small refiners could not be awarded contracts at prices higher than the weighted average of other successful bidders, the Senate Small Business Committee says. The committee urges MPSA to work more closely with the Small Business Administration.

•

The backlog at the Federal Power Commission may grow even higher. Congress sharply trimmed FPC's request for funds. Officials say this will stymie the commission's recruitment program—and make it impossible to whittle down the backlog of thousands of cases involving independent gas producers.

Natural gas producers probably will have to file financial reports, despite strong protests by independent producer groups. FPC required producers to file financial data in 1956. Oral arguments will be held after Labor Day as to whether even more extensive data should be required this year. The commission staff insists full data on producer revenue is essential to intelligent regulation. The financial reports probably will be required, despite producer protests that FPC shouldn't demand data on intrastate sales, over which it has no jurisdiction.

•

Proponents of small business tax relief plan a barnstorming trip. The Senate Small Business Committee will hold hearings this fall in 15 cities, with the aim of building pressure for special tax relief for small businessmen. Oil jobbers and small refiners will have an opportunity to ask tax help on special problems.

TESTING

(For Quality Control)

Since 1926 Ethyl has been working with the oil industry to develop and improve laboratory and road testing of gasoline quality.

The development of the octane scale is one of Ethyl's pioneering achievements.

Today Ethyl's testing skills and experience are available to train your personnel in knock-rating and tetraethyl lead analysis techniques and to help service knock-rat ng equipment.

Many oil companies also use Ethyl's testing laboratories and instrumented road-test cars to test gasoline stocks and finished blends—to provide extra proof of product quality and to double check their own testing accuracy.

Your Ethyl representative can explain how you can get full benefits from this testing service and the many other services available only from Ethyl.

ANOTHER SERVICE OF

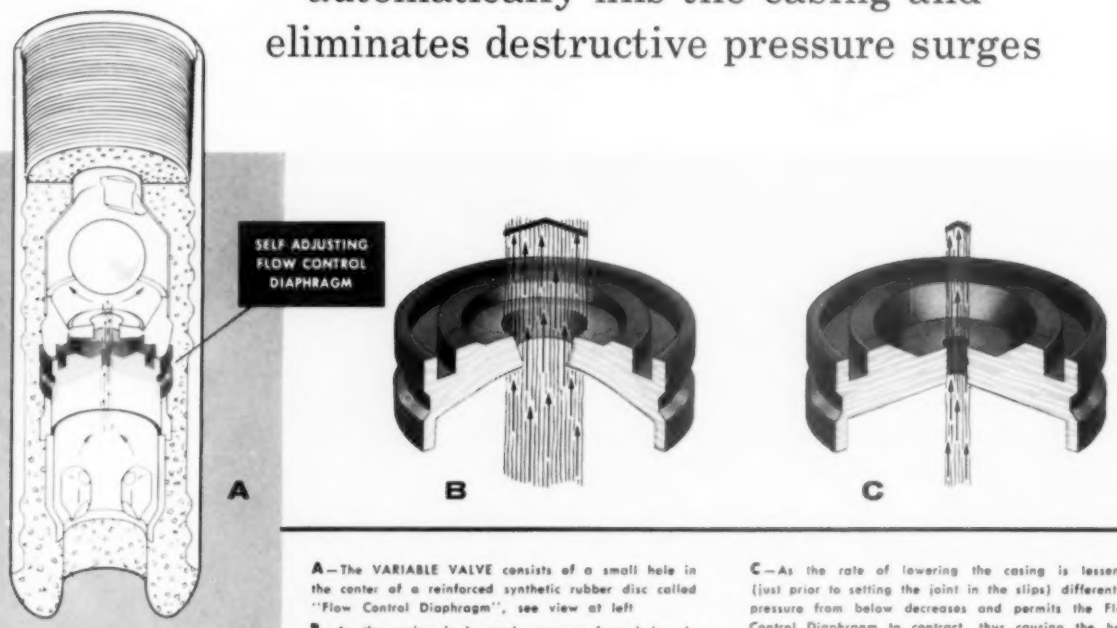
"ETHYL" ANTIKNOCK COMPOUND — ETHYL CORPORATION

ETHYL CORPORATION

NEW YORK 17, N. Y.

See for yourself...

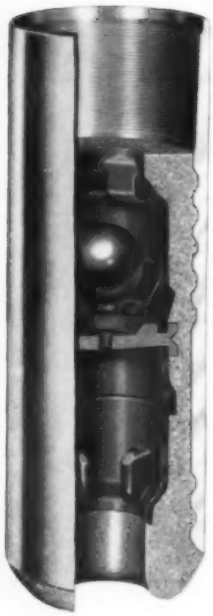
how the variable valve in FLEXIFLOW Shoes and Collars automatically fills the casing and eliminates destructive pressure surges



A—The VARIABLE VALVE consists of a small hole in the center of a reinforced synthetic rubber disc called "Flow Control Diaphragm", see view at left

B—As the casing is lowered, pressure from below is exerted on the diaphragm and causes the hole to open up (see B) and a sufficient volume of fluid enters the casing to prevent a build up of destructive pressure surges

C—As the rate of lowering the casing is lessened (just prior to setting the joint in the slips) differential pressure from below decreases and permits the Flow Control Diaphragm to contract, thus causing the hole to return to its smallest diameter (C). The reduced volume of fluid entering the casing prevents overfill.



Baker
FLEXIFLOW FILL-UP Shoe
Product No. 160

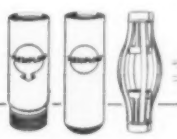
When casing equipped with FLEXIFLOW Shoes or Collars is lowered in the well, increase in pressure from below causes the variable valve to open up wider to relieve pressure from below by permitting a large volume of fluid to enter the casing. When downward movement of the casing is slowed down, pressure from below is reduced and the hole in the diaphragm contracts to restrict the fluid entry and prevent overfilling. This action of the variable valve in opening wider and closing down, synchronizes the rate of fill of the casing with the rate of lowering the casing, *and in so doing provides maximum relief from pressure surges.*

CUTS RUNNING TIME ONE-THIRD — Baker FLEXIFLOW Shoes and Collars can safely reduce casing running time by as much as one-third, because . . . they completely eliminate time-wasting surface filling of casing; and they permit the casing to be run faster due to the automatic "fill" from the bottom that eliminates possible damage to the formation from high-pressure surges.

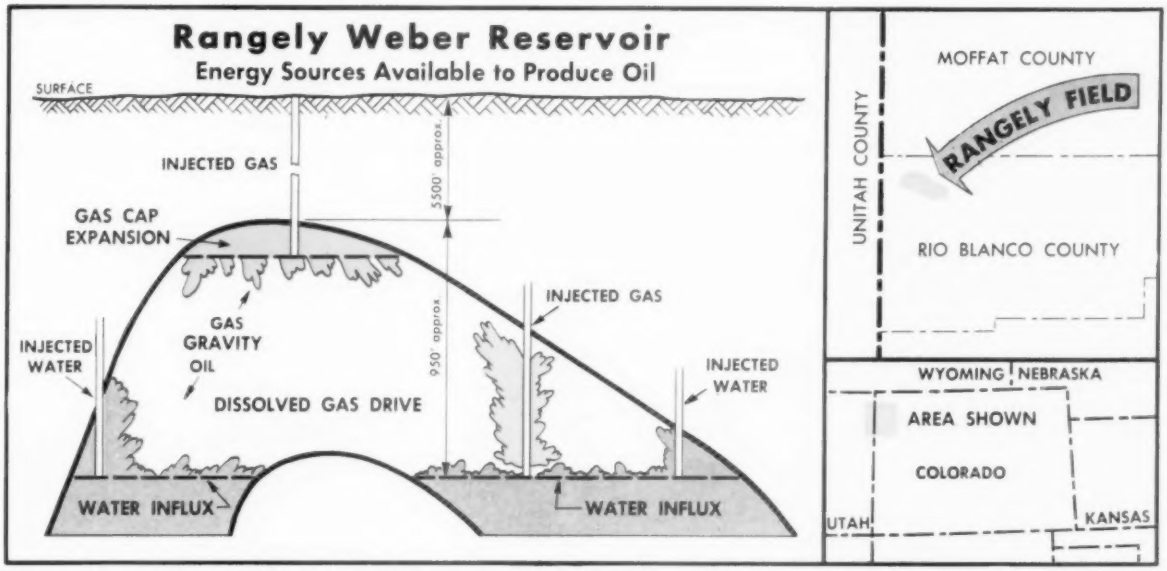
BAKER OIL TOOLS, INC., HOUSTON • LOS ANGELES • NEW YORK

There's a Baker representative near you ready to explain the application of FLEXIFLOW Shoes and Collars and the part they play in Baker "Protective" Cementing.

For better Primary Cementing
Baker Flexiflow Fill-Up Collars and Shoes
Baker Casing Centralizers
Baker Wall Scratchers



BAKER FLEXIFLOW



NATURAL DRIVE SOURCES (left) in Colorado's Rangely field will be augmented by gas injection and water flooding as . . .

New Era Opens for Unitized Rangely

Look for a big spurt in activity at Rangely, Colorado's largest field, now that unitization has been approved.

The unit agreement was reached last week in Denver, climaxing efforts begun about 11 years ago.

The agreement was approved by 99.5% of the 45 working interests and by 93% of the approximately 450 individuals and companies controlling more than 600 royalty interests.

The signing was hailed by Warwick M. Downing, chairman of the Colorado Oil & Gas Conservation Commission, as "important as the discovery of a new oil field with 400-million bbl. of recoverable oil."

The signing also sparked forecasts of greater activity in the big field. C. L. Pickett, Rocky Mountain Division Superintendent for the California Co. and chairman of the Rangely (field) Operators' Committee, said that "undoubtedly, Rangely will be the scene of more activity over the next months than it has been at any time since the early stages of its development."

Here are some of the results expected from unitization:

- Up to 400-million bbl. of oil, or more, will be recovered through secondary recovery methods.
- Most gas flaring will be eliminated.
- Recovery of liquid products from the natural gas will be increased.
- New facilities will be constructed, others relocated.
- Many new field gas gathering lines will be built.
- New wells will be drilled, others deepened and reworked.
- Additional service company work is expected.

The unit agreement came on the eve of a hearing by the Colorado Oil & Gas Conservation Commission to consider "measures to prevent waste of oil and gas" at Rangely.

WARWICK M. DOWNING, Colorado Oil & Gas Conservation Commission chairman, was a leader in unitization drive.

The state commission approved the unit application after its hearing Aug. 21. The agreement now goes to the U. S. Geological Survey for expected approval. Both agencies have been pushing unitization.

The commission, however, made no move to cut Rangely's production —nearly 72,000 b/d—as it had threatened to do in summoning operators to the hearing.

The commission's threat to cut production "at least" 20%, announced Aug. 3, apparently aided in conclusion of the unit agreement.

Chairman Downing applauded the operators for reaching unit agreement, saying: "We realize the terrible and tremendous task you faced.

"Additional recovery of 400-million bbl. may seem high, but I believe the industry will accomplish it by means of unitization and with a free hand to apply technical innovations."

Flaring of gas at Rangely, main target of criticism from the state commission, is expected to be cut in half "within two to three weeks" after unit operation begins, about Oct. 1.

About 45-million cu. ft. of gas is being flared daily in the field. There are 47 injection compressors scattered around the field, and a gas processing plant with a process capacity of 50-million cu. ft. daily. After extracting propane, butane, and other liquids, 30-million to 35-million cu. ft. of

dry gas is returned daily to the reservoir. The 47 compressors return about 60-million cu. ft. of wet gas daily to the reservoir.

Despite the fact that approximately 90-million cu. ft. of gas is now being injected daily, there still is 45-million cu. ft. of gas being flared.

Pickett said he expects the flaring to be cut about 50% in the first few weeks after unit operation begins. "After that the reduction will be slower.

"However, in a few months we can expect to virtually eliminate the flare without the construction of any more compressors or gas plants."

Pickett said this would be done by shutting in high-ratio gas-oil wells and stepping up production from low-ratio gas-oil wells—a major advantage of unitization.

Some Rangely wells have ratios in excess of 20,000 cu. ft. of gas to each bbl. of oil produced.

Pickett said that gas for reinjection will be taken on a selective basis, and that this might affect production. He added, however, that not much change in the field's total production of oil is anticipated.

Within three to five years, projected water floods are expected to release substantial quantities of gas now being injected.

It's not known yet what disposition will be made of the gas so released. Eventually, however, it may be sold, presumably to Pacific Northwest Pipeline Co.

Rangely's natural gas has a high nitrogen content and only about 700 Btu. content per cu. ft. It's likely, therefore, that this low-quality gas may enter pipelines under some penalty. Cost of treating the gas to remove the nitrogen is considered excessive.

The unit is the second largest, in terms of reserves, ever formed in the country. Only SACROC, in Scurry County, West Texas, is bigger.

A total of 481 wells (41 flowing, 400 pumping, 19 gas-injection, 18 shut in, and 3 abandoned) have been drilled in the 19,195-acre field since it was discovered 55 years ago. Daily production currently represents about 48% of the Colorado total.

Total production to July 1, this year, is estimated to amount to more than 225-million bbl. of oil.

It's been estimated that up to 350-million bbl. of oil could be recovered by primary methods. Gas injection and water flooding are expected to boost recovery by as much as 400-million bbl., or more.

Estimates of oil-in-place range up to 1.5-billion bbl. Life of the field is estimated at from 30 years to 40 years under gas injection and water flooding.

The unit contains about 43% federal lands, 57% patented lands. It will be under the supervision of the USGS; The California Co., largest holder in the field, will be unit operator.

Among principal working interest holders are: The California Co., 45.9%; Phillips Petroleum Co., 6.32%; Husky Oil Co., 3.38%; Weber Oil Co. (Equity Oil), 4.10%; Pan American Petroleum Corp., 10.07%; The Texas Co., 3.98%; Union Pacific Railroad, 12.97%; The Cameron family, 3.97%; Tidewater Oil Co., 1.13%, and Sharples Oil Co., 1.45%.

J. A. Schwabrow, regional USGS director, points out that Rangely contributes about $20,000 in royalties to the federal government daily. This is about 20% of the total federal royalties obtained from a nine-state USGS region.

Pilot floods, probably on the east side of the field, will be started as soon as possible after unit operation begins.

Salt water from upper formations will be used. No treatment will be necessary, initially.

The number of injection wells has not been decided yet, but the pilot floods will give some idea as to how many may eventually be needed, assuming the pilot operation confirms the ideas of those who maintain a water flood is practicable in the field.

The east side of the field is the tightest area, and may require five-spot treatment.

Pilot flood engineering proposals have been roughed out and will be ready for submission to the operator within 30 days.

Laboratory work has shown Rangely's Weber (Pennsylvanian) sand reservoir is susceptible to water floods.

Rangely itself is a double plunging, northwest-trending anticline located on the Douglas Creek Arch, which trends north from the Uncompahgre Uplift. The Rangely anticline is about 20 mi. long and about 5 mi. wide, with about 2,300 ft. of structural relief, the vertical distance from top to bottom.

There are four natural sources of energy drive to produce the oil, of which the major source is dissolved gas. Minor natural drive sources in the reservoir are the gas cap, water drive, and gravity segregation. The solution gas drive, according to estimates, would lead to recovery of only 15% to 25% of the original oil in place.

The Weber formation is a fine-grained sand with low porosity and low permeability, with the former averaging about 12% and the latter averaging from 10 millidarcys to 15 millidarcys.

The Weber oil-water contact at Rangely varies more than 300 ft., from about 1,050 ft. elevation to about 1,350 ft. elevation. This is due, it is believed, to differences in porosity and permeability caused by interbedding of Weber and Maroon formation type sediments.

Jack Tarner, a Phillips engineer, says that a slow peripheral flood, such as is now being considered, may recover much of the tightly-held oil, despite the fact that water flooding is still an untested recovery process at Rangely.

It's theorized that stratigraphy plays an important role in the distribution of Weber oil accumulation at Rangely. Core data also show that the upper part of the Weber is highly fractured, adding to the complications Rangely producers face.

The field's performance so far has been close to original surveys. Recovery per lb. of pressure drop on the east side of the field is a little less than originally estimated; on the west

New Rig in Pacific

Standard Oil Co. of California will build this offshore drilling platform next year on state-owned submerged lands near Sutherland, Calif.

The $2-million structure is designed to drill two tests simultaneously, and will be able to drill a total of 25 tests on the same location.

The platform will have a deck 110 ft. square, standing about 50 ft. above the water on four pillars.

The unit will be painted a "subdued" color, to blend into the seascape.

side it's a little higher. Present reservoir pressure is about 1,000 psi.

Expanded use of hydraulic fracturing also is planned. Automatic custody transfer is among other operations being considered for the unit.

Recent use of large-volume hydraulic fracturing in some wells has materially increased recovery. Further use of this process is likely under unitization.

ACT has been considered for adoption and will be used when deemed practicable.

The number of wells to be shut in, additional capital investment, and other operational factors haven't been worked out yet.

A relatively unique feature of the operating agreement is the fact that the capital investment adjustment formula considers the equipment cost at two-thirds its original cost, not its present cost.

Personnel employed at the field will not be decreased under unit operation.

Though Rangely was discovered in 1902, no major oil play occurred until the latter part of World War II.

Development of the field was slow due to the fact that it was too far removed from any marketing area, was isolated from rail lines, and even from any major highway.

But World War II brought on such heavy demand for crude that development at Rangely was pushed. In 1944, 3 wells were drilled; in 1945, 32; in 1946, 146; and in 1947, 167. Postwar demand pushed development even further.

A 10-in., 36,000-b/d pipeline was completed by Utah Oil Refining Co. in late 1945. Three years later, Salt Lake Pipe Line Co. completed another 10-in. line to Salt Lake City. This line had a capacity of 38,000 b/d.

A gasoline plant, owned by a number of operators in the field and operated by The California Co., was completed in 1948. In 1950, a pilot gas injection program was conducted independently by several operators. This led to the construction of present facilities which now inject about 90-million cu. ft. of gas into the Weber daily.

Unitization now opens a new era for the field.

Operators throughout the state are expected to watch Rangely closely. Its operations may well touch off a growing movement toward unitization in other fields.

If results are as anticipated, there's no doubt that Rangely will remain among the major fields of the country for many years to come.

The pay-off for Nortex:

Concentrate on Known Oil

Soaring exploratory drilling costs, relatively meager finds, and the operation of tax and regulatory laws are combining to produce a new kind of oil company—one that specializes in the secondary recovery of reserves already found.

In the late 1930's, the industry drilled less than 30 ft. for each 1,000 bbl. of new oil discovered. In 1956, it had to drill almost 80 ft.

Average well depth back in the earlier period was less than 3,000 ft. Now, it's around 4,025 ft.

The cost of all materials and services have gone up.

At the same time, because of the pressure of many factors, including imports, domestic production allowables per well have decreased.

As a conservation measure, state regulatory bodies generally have adopted policies which encourage secondary recovery projects—as brought out recently at the Interstate Oil Compact Commission meeting in Yellowstone Park (PW—Jun.14'57,p16).

Such projects frequently are virtually exempt from over-all production restrictions. The reasoning is obvious: It is to the public interest that as much oil as possible is recovered, as little as possible left in the ground. It takes money to institute such projects, and the operator is entitled to a reasonable payout, and some profit.

For many years, companies have gone into secondary recovery after fields declined from primary production rates. Some of these programs have paid out handsomely.

For example, one operator reportedly spent about $250,000 on several waterfloods in the old Illinois Basin and netted almost $4½-million profit in three years.

But starting such operations while production is still in the primary stage is something different. Nortex Oil & Gas Corp., of Dallas, is one of the more striking examples of this approach. Nortex was formed in July, 1954. It had just one producing well —in Montague County, Tex.

The company's oil and gas sales are now running at the rate of about $2-million annually.

It has waterfloods going in the Baylor County Regular field and in the McElreath field, Brown County, Tex. Nortex will put four more waterfloods into operation before the end of 1957 —15 more during 1958.

Nortex's net producing acreage totals 3,080 acres in Texas, Louisiana, and Mississippi, with a net total of 72 wells. It has a net non-producing acreage of 29,077 acres in Kentucky, Mississippi, New Mexico, Oklahoma, and Texas.

The company's reserves now are about 7½-million bbl.—divided almost equally between primary and secondary recovery production.

Nortex's basic approach is founded solidly on one simple premise: There is a bigger, faster return today, in many cases, from secondary recovery than from exploration and primary production.

Here's the way James R. Wendover, Nortex president, sketches the situation that shaped the company's operational strategy:

"It's a matter of economics. The cost of exploration for new oil continues to skyrocket, with more and more discouraging results.

"It's almost impossible to make any money on a gross after-tax dollar basis with present costs of exploration, drilling, and associated services—with the reserves that you can reasonably expect to find—at the current price of oil.

"The only way that anybody—company or individual—can make money today, under the conditions governing drilling for oil, is through the use of tax benefits, which the government has been wise enough to provide.

"This means the only way a company such as ours can make money is through the use of better, more economic, more efficient tools for the recovery of oil already discovered and known to be in the ground."

James W. Law, Nortex vice-president for reservoir engineering, translates this strategy concept into tactics this way:

"On every dollar spent for secondary recovery, you will get back three dollars, gross.

"We made an economic study of the factors and have made all our reserve approaches with that in mind."

Nortex concentrates on buying properties that have good secondary recovery possibilities—not just depleted, or nearly depleted, fields.

"You're better off from the standpoint of economics to buy a field that is in good shape," says Law. "Depleted fields are too old. Records of their early days either are missing or are inadequate.

"It costs too much to run tests and

accumulate missing records, install needed equipment, rework the old wells, and so on.

"Every dollar spent that way is a capital dollar out of your pocket, and you can't get financing for it. In a good field, the only capital dollars spent are those for putting in a secondary recovery project."

During 1956 the company drilled 94 wells, totaling 328,680 ft., with 41 producers. The drilling, says Law, hasn't contributed substantially to Nortex's reserves, however.

The company also invests, to some extent, in properties that have only secondary recovery prospects.

The company doesn't wait for primary production to slow down. It starts right in with waterflooding.

"We are not interested in waiting until it is a question of basic economics—of abandonment versus secondary recovery," explains Law. "Instead of fighting a field for 20 years, we can get the same, or greater, recovery in less time.

"That way, we can save years of operating expense. From a net profit standpoint, that is an unbeatable situation.

"The risk, of course, is that if your secondary recovery program fails, you will also lose some of the primary oil. This depends on the competency of your engineering staff."

One concrete example of the Nortex approach is its Baylor County (Tex.) activity.

Nortex entered the Regular field play somewhat late. "But we were able to buy developed and partly developed leases at a relatively cheap price because we sized up the secondary recovery potential better than most," comments Law.

He says some of the leases acquired "came through good fortune," and others "through original work."

Entering the Regular field in the latter part of last year, Nortex now has "pieces of five different reservoirs" in which it hopes to institute five different secondary recovery programs, starting a straight waterflood in each.

Production is from the Tannehill sand—a shallow formation 1,400 ft. to 2,000 ft. deep. The section runs as thick as 80 ft. Reservoirs are characterized by a solution gas drive.

Technical details of the full five programs haven't yet been settled because a unitization program is under way.

But Nortex started water injection as soon as it purchased its properties (a net total of 18 wells), and Law says that "there is a good deal of secondary oil to be recovered.

"The very porous sand quality is so much better than most of the stuff in this area that the ultimate recovery will be quite high." He adds: "It will be a very high return situation, very cheap to develop."

Here's the way it stacks up in Nortex's estimation on the development of reserves it holds:

- Primary recovery would be around 2¼-million bbl.
- Secondary recovery will add another 1¼-million bbl.
- Aggregate ultimate recovery, therefore, will be around 3½-million bbl.

By not waiting for the primary production to slow down before going into secondary recovery, Nortex expects to cut down the total period of time it would normally require to flush out the reservoirs—trimming off perhaps ten years.

And the company is not spending the money it would require to find 1¼-million bbl. of new oil through exploration—the amount of crude that it will obtain through a relatively inexpensive waterflood operation.

The company isn't geared for experimental work in secondary recovery. But it expects to take advantage of new ideas as they are proved.

Nortex isn't ruling out the possibilities of such new secondary recovery techniques as miscible gas drive, but it won't spend its money experimenting. On the other hand, the company isn't lashed tight to traditional thinking. For example, it believes in using far fewer injection wells than is customary with many companies.

"This cuts down on installation costs and we believe it increases ultimate recovery," explains Law. "There might be some disagreement within the industry on this, but we are convinced that, with a large number of injection wells, there is a pressure interference between them which results in dead spots."

Nortex apparently isn't having much trouble finding suitable deals.

"When people find out you're in the market, a lot of them submit deals," says Law.

"And, when there's money available, we actively search for good properties. It amounts, actually, to a kind of exploratory search for producing properties."

New 'Copter Lifts More, Farther, Faster

The world's largest commercial helicopter, designed to provide transportation of field crews and heavy equipment in offshore and other drilling operations, has been introduced by Vertol Aircraft Corp., Morton, Pa.

The new 'copter, called the Vertol 44, is an advanced version of the company's H-21 "Work Horse," widely used in military service. The commercial model has a 25% higher payload over a 100 nautical mile radius than earlier military models now in use, the company says.

Harry H. Pack, Vertol vice-president, says that the Vertol 44 is capable of transporting all parts of a new exploratory rig, designed by National Supply Co. for transport by helicopter, in only 56 flying hours to a point 50 mi. away.

The whirlybird can carry 19 passengers in its 600-cu.-ft. cabin, or over two tons of cargo, either inside the cabin, or by an external sling.

Pack points out that the craft has a wide center of gravity, permitting fast loading at terminal points without having to juggle cargo to achieve a stable flying condition.

The 'copter has a cruising speed of 88 knots, a range of 315 mi. and a service ceiling of 10,600 ft. Its CAA certified gross weight is 14,000 lb.

Adomite® gives least fluid loss at bottom hole conditions

Many fracturing additives show desired fluid loss control at surface conditions of low pressure and atmospheric temperature. But at bottom hole conditions, fluid loss becomes so high that effectiveness is lost. Fluid loss control tests demonstrate how effective and profitable Adomite is downhole—in marked contrast with other fluid loss additives.

Compare the deep-down effectiveness of Adomite with other loss control additives

	Fluid Loss at Surface Conditions—100 psi,* 75° F., cc/30 min.	Fluid Loss at Bottom Hole Conditions—1000 psi, 150° F., cc/30 min.
ADOMITE + crude oil	2.2	22.0
Additive X + crude oil	37.8	Infinite
Additive Y + crude oil	8.5	Infinite
Additive Z + crude oil	13.0	295 (1 min., 50 sec.)

*(Standard API Code 29 Test)

Adomite, when mixed with oil, disintegrates into millions of tiny particles. These particles seal the face of the formation and keep the fracturing fluid from filtering in. Temporarily sealing the formation, Adomite particles do not plug it.

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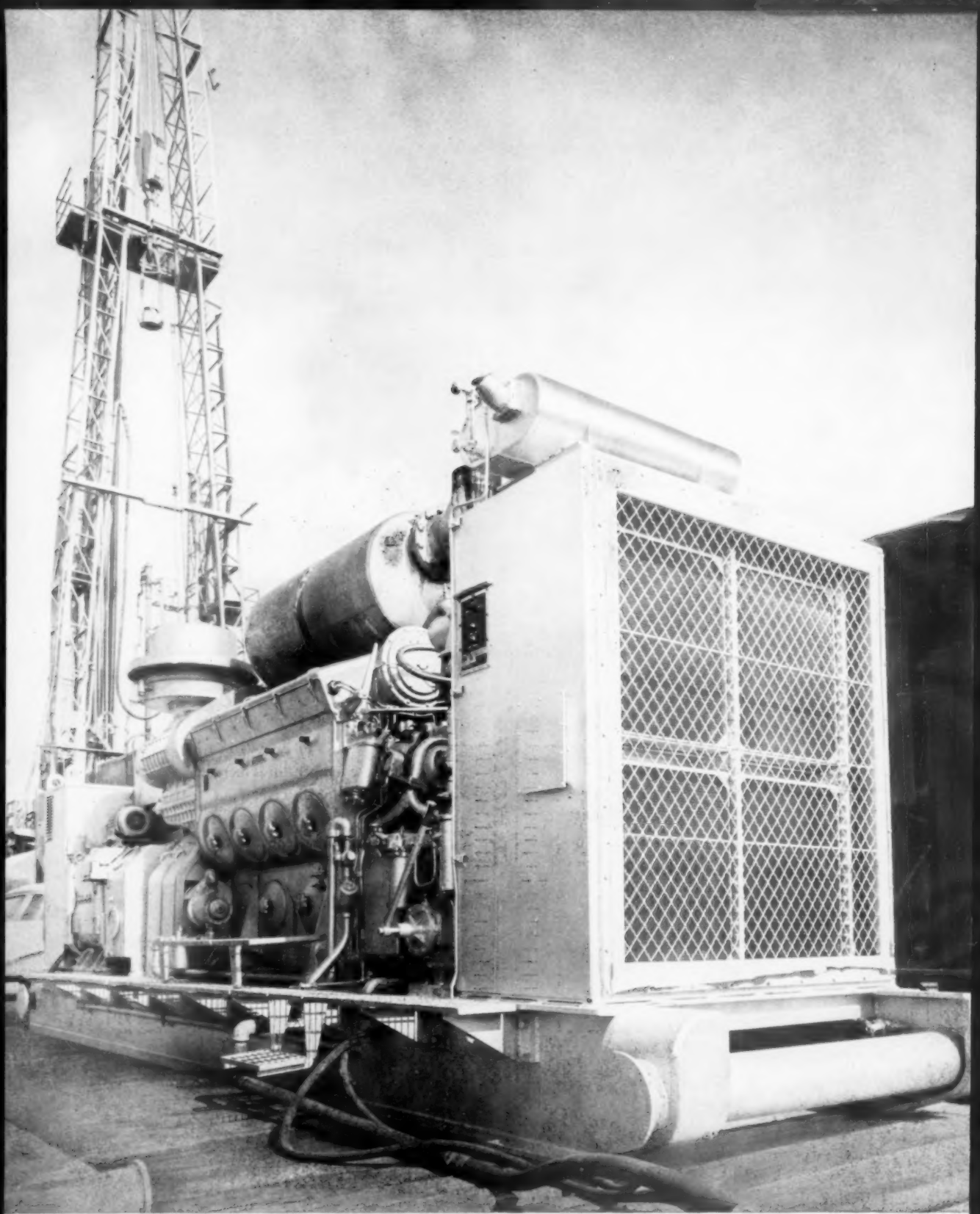


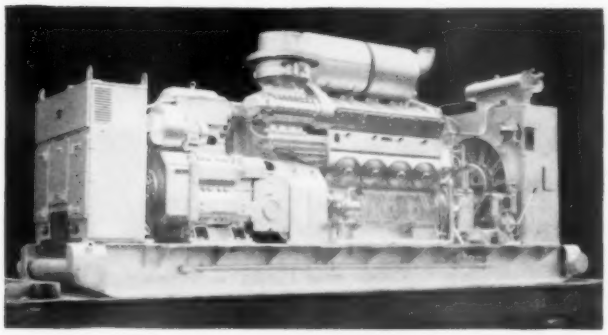
In operation on Sun Oil Company's Rig 15 at Rayne, La. is Electro-Motive's new drilling power unit, the SR-10. Main features include increased engine hp, increased generator and drive motor capacity, lighter weight, integral AC generator, simplified maintenance and load regulator control.

Announcing
a significant advancement in
deep well drilling power

New Electro-Motive SR-10 Power Unit

In 1955, Electro-Motive introduced the first fully integrated Diesel-electric power system for oilwell drilling. Success of these units is demonstrated by the fact that Electro-Motive Power is widely used by drilling companies throughout the Gulf Coast area.

Now, Electro-Motive offers another first and significant contribution to the oil industry's increasing need to drill deeper, faster and more economically — the first standardized, completely self-sufficient Diesel-electric power system. These are its features:



The SR-10 is a refinement of Electro-Motive's original plan to build a *complete* and integrated Diesel-electric system designed and built to work as a unit with one manufacturing responsibility.

For detailed specifications on the new SR-10 unit, contact your Electro-Motive representative in any of the cities listed below.

INDEPENDENT AC SUPPLY

A new integral AC generator (100-KW) makes the SR-10 completely independent of outside supply for its own AC needs—blowers, exciters, control equipment.

INCREASED POWER

Engine horsepower has been increased to 1000. New D49-G generators produce up to 640-KW each (2 per engine). New D49-M drive motors deliver up to 800 horsepower.

GREATER POWER UTILIZATION

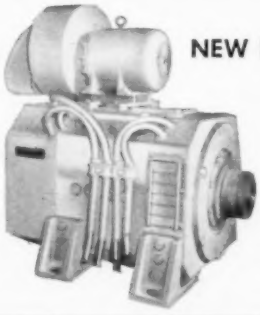
New load regulator provides load balance between units. Thus, if power requirements exceed that available on one unit, the load regulator automatically loads a second unit to satisfy drilling demands.

REDUCED MAINTENANCE

New improved motor control cabinet is simpler and more efficient. Its new design combines with many other improvements, both electrical and mechanical, to appreciably reduce overall maintenance time and expense.

LIGHTER WEIGHT

A new speed-increasing transmission between the engine and generators and other changes have cut the weight of the air cooled unit by more than 2000 pounds.



NEW D49-M DRIVE MOTOR

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Saskatchewan Pushes Unitization

The Saskatchewan Dept. of Mineral Resources is stepping up its efforts to encourage unitization as the first move in getting oil companies to begin secondary recovery programs earlier.

The idea is to get pressure maintenance programs started before the drop in reservoir pressure becomes serious enough to affect pumping.

A resources department spokesman says that unitization is a necessity for practice of good conservation measures throughout the province's oil and gas fields.

The nature of the fields is such that full-scale pressure maintenance is almost impossible without prior unitization.

Most fields in the province are broad and shallow, says a resources department official. Depths seldom exceed 4,800 ft. in the southwestern part of the province; and average depth in the southeastern part is about 4,400 ft., becoming even shallower near Manitoba. Pay zones are similarly shallow.

Though the fields are shallow, they extend over large acreage and involve the rights of many oil companies.

Under these conditions, the official says, it can sometimes pay oil companies to unitize operations, because then the prevailing spacing for drainage units can be superseded by spacing determined by formation characteristics.

Guidance in unitization plans is coming from a Tulsa consultant.

Herman H. Kaveler, a petroleum engineering consultant, is advising the department and the Saskatchewan Oil & Gas Conservation Board on unitization problems.

Full-scale pressure maintenance is barely 18 months old in Saskatchewan.

Programs are under way in the southwestern part of the province in the Coleville-Smiley and Brock gas fields, and in the Dollard field, which produces medium-gravity crude oil.

Tidewater Oil Co.'s waterflooding program at Dollard, which began last summer, was the first of its kind in Canada.

In the newer southeast fields, secondary recovery programs have yet to be introduced on a wide scale. But it appears that the Department of Mineral Resources is pushing unitization here with a view to fairly early introduction of recovery programs. One field, Alida, was unitized five months ago. Department officials say that a recovery program in the field might get underway shortly, although pumping is still delivering a satisfactory flow.

The most recent example of unitization prior to a recovery program is the Hoosier Viking sand gas pool, where unitization went into effect Aug. 1. Canso Natural Gas, Ltd., is the operator of the unit.

So far, the mineral resources department has been pushing unitization by depending on incentives, plus a great deal of formal and informal discussion with representatives of the oil companies concerned.

One of the most attractive incentives is relaxation of the 80-acre drainage unit spacing under unitization, which is the prevailing individual well control allowable for drilling and completion.

In the department's unitization order for the Hoosier Viking sand gas pool, for example, the usual spacing regulations are superseded by others which provide that gas production from the Viking sand must be dependent on reservoir conditions.

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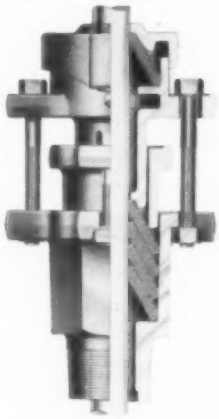

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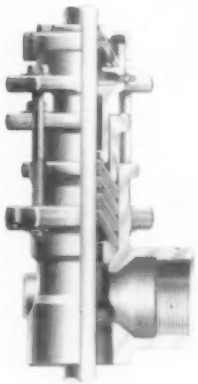

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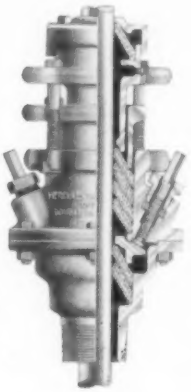

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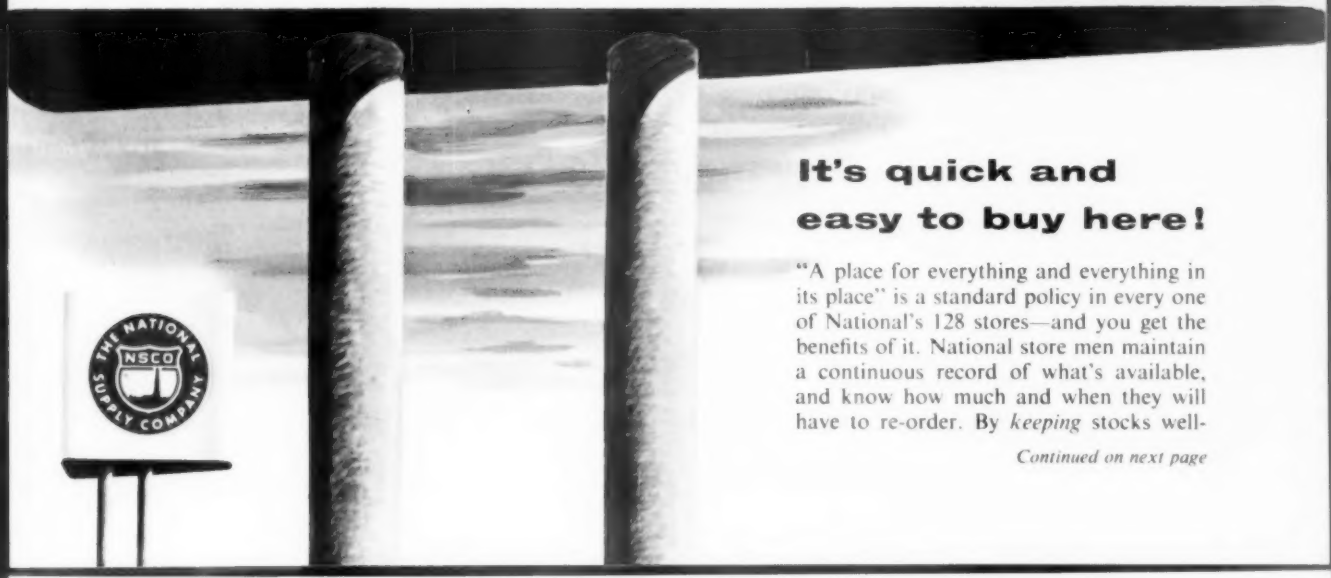

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Continued from previous page

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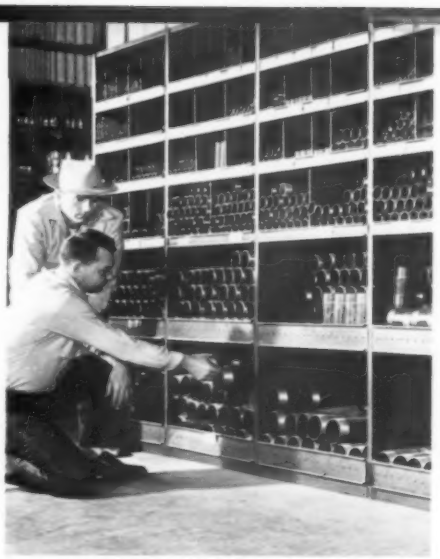

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12. Horizontal design gives larger support area as well as lower center of gravity, thereby reducing vibration.
13. Reversible crankshaft assembly permits direct connected engine drive.
14. Suction and discharge connections arranged for piping from either side of pump.
15. Skids optional for unitized portable mounting.

*Patent Pending

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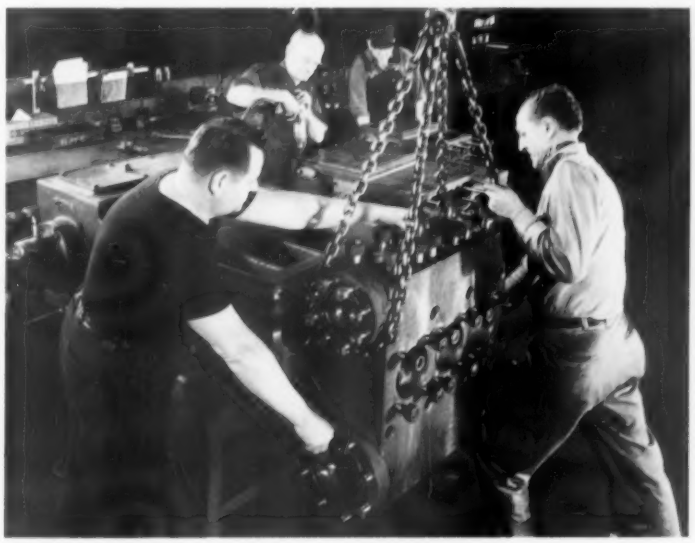

In National Supply's Toledo, Ohio plant, skilled personnel assemble the fluid end of a triplex pump. The four Triplex pumps (F-15, F-30, F-60 and F-90) in the National Line have a rated input hp range of 16.7 to 100 hp, with fluid ends available for high or low pressure, corrosive or non-corrosive service.

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More quality production equipment on the next page!

This installation in Alabama is a typical example of National Pumping Units and wellhead equipment in use on dual completion wells.

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Having trouble with load reversals? National Pumping Units have an extra margin of strength that meets this problem. They have exceptionally hard alloy steel gears and pinions designed for long wearing life. Gear train mounting and main bearings offer lower shaft loading and deflection . . . easily handle shock loads from load reversals.

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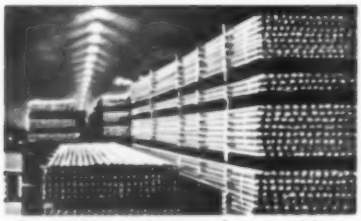
Get the facts on National Pumpers today. For the full story on the high performance and low operating costs they offer, see the National Supply Store men or representatives in your area soon. New bulletins giving the complete story on these quality pumping units are available.



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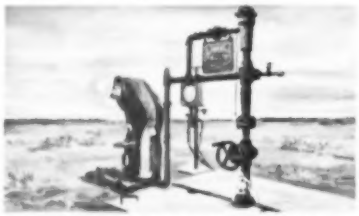
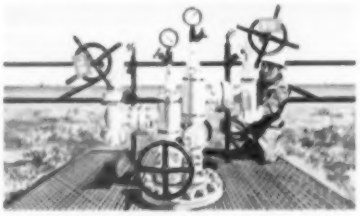


For certain types of wells, the National Plunger Lift can be the best production method. It uses either formation gas or injected gas for operation. See your National representative for details.



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What's New / IN EXPLORATION, DRILLING, PRODUCTION

Washington Discovery Gets Production Test

Sunshine Mining Co. No. 1 Medina, Grays Harbor County, Wash., has undergone production tests (PW—Aug.2'57,p31).

Sunshine ran about 1,000 bbl. to storage tanks, then shut in the well to await an outlet before testing further.

The well produced initially at the rate of 175 b/d to 200 b/d, but the flow declined to 125 b/d, according to a company official. Bottomhole pressure also dropped considerably during the test.

Sunshine president Robert M. Hardy, Jr., said the company plans three tests with a view to defining the limits of the field.

•

Properties Change Hands

McRae Oil & Gas Corp., through two purchases, has acquired leases in Kansas, and in the Paradox Basin and Uinta Basin areas of Utah.

The company purchased leases in Cowley County, Kan., from L. C. Smitherman, for $700,000 cash and 200,000 shares of McRae stock. There are about 24 wells on the lease.

In another purchase, McRae bought the outstanding stock of Paradox Oil & Gas Co., for 125,000 shares of McRae stock.

Acquired in this purchase are about 51,000 acres of oil and gas leases in the Paradox and Uinta Basins in Utah.

White Eagle Oil Co., of Tulsa has purchased an 11,000-acre block in Archer County, North Texas, from W. B. Hamilton, of Wichita Falls.

The company will start a secondary recovery project in the area in the near future.

Hiawatha Oil & Gas Co. has bought ten Canyon sand oil producers in the Yan-Kee field, Tom Green County, West Central Texas.

The wells were purchased from J. R. McLean, Dallas, and J. D. Tompkins, Abilene, for an undisclosed amount.

Hunt Oil Co., Dallas, has bought an undisclosed mineral interest on Bassett Ranch land in Terrell and Val Verde Counties, Southwest Texas. Purchase price was $825,000.

Sale was made by Martin Trading & Commission Co., Dallas, and covered a portion of the Bassett mineral estate.

Reiter-Foster Oil Corp. has formally completed acquisition of the properties of Advance Petroleum Co., and the producing properties of Carl J. Westlund. Purchase price was $1.5-million in stock and cash.

Included in the Advance properties are 58 producing oil and gas wells in Texas and Oklahoma, and 14,787 undeveloped acres in Texas.

Shareholders of Vulcan Oils Ltd., have approved a proposal to acquire all assets of Newclare Oils Ltd., along with certain oil and gas holdings and other assets of Siscoe Mines Ltd., and New Davies Petroleums Ltd. The consolidated company will be known as Siscalta Oils Ltd., and its holdings will include a 16.5% interest in the Chamberlain-Bindloss gas field, which has started supplying gas to Trans-Canada Pipe Lines Ltd.

•

A poll of California state legislators indicates that a majority believe legislation enforcing repressurization of the Long Beach-Wilmington oil field has a good chance of passage in the 1959 regular session.

The poll, conducted by Congressman Craig Hosmer (R., Long Beach), reportedly showed that 77% of the legislators think that a mandatory repressurization bill under study by an assembly interim committee will pass in a modified form either at a special session next year or at the 1959 session.

•

A survey to determine annual and daily drilling costs in Western Canada has been launched by the Canadian Assn. of Oilwell Drilling Contractors.

The survey is designed to give newcomers to the industry an impartial summary of annual costs per rig and per operating day.

•

Louisiana's mineral leasing revenues have jumped back into the million dollar category after three months of relatively low bids.

The latest sale of leases on 17,073 acres of state-owned lands brought $5,107,694, the highest total in almost a year.

Delhi-Taylor Oil Corp. was high bidder, paying $1.5-million for 2,500 acres in Timbalier Bay, Lafourche Parish.

Stockholders of American Tidelands, Inc., and Marine Drilling, Inc., have approved plans to merge into a single firm.

The new firm retains the name Marine Drilling, Inc. The company owns and operates four inland water drilling barges, and one offshore drilling barge.

•

A total of 15,209 acres in 11 North Dakota counties will be offered for lease by the Bank of North Dakota Sept. 24.

Acreage to be offered, in 157 tracts, are in the following counties: Billings, Burke, Divide, McHenry, McKenzie, Morton, Mountrail, Rolette, Sheridan, Stark, and Ward.

•

The Louisiana State Mineral Board has slated a hearing for Sept. 12 on commingling of oil from separate leases in offshore fields.

The state Dept. of Conservation will make recommendations for minimum standards of offshore production and measuring equipment.

•

The Texas Railroad Commission has approved miscible phase injection for The Texas Co.'s Tijerina-Canales-Blucher field, Jim Wells County, Southwest Texas.

Pressure maintenance and secondary recovery operations in the Tijerian Zone 3 reservoir had been previously approved.

•

The Colorado Oil & Gas Commission has approved unitization of the Little Beaver field "D" sand, in Washington County. Continental Oil Co. was designated operator.

The commission said that unitization is expected to double the field's

originally estimated primary recovery of 9-million bbl.

Little Beaver is the third major Colorado field to be unitized (see p. 19).

•

Drilling Highlights

Utah—Pure Oil Co. No. 1 Big Flat Unit, section 14-26s-19e, Grand County, flowed 319 b/d of 43.3-gravity oil through perforations in the Leadville member of the lower Mississippian at 7,694-728 ft. The discovery, 14 mi. west of Moab, is in the north end of the Paradox Basin.

Oklahoma—Shell Oil Co. No. 1 Boyd, section 15-9n-22w, Beckham County, was completed for 21-million cu. ft. of gas daily, plus an ungauged amount of 50-gravity condensate. Production is from the Atoka (Pennsylvanian) sand through perforations at 10,114-74 ft. and from open hole at 10,212-65 ft.

Louisiana—Lion Oil Co. No. 1 Bayou, Broussard field, Lafayette Parish, has been completed as a high pressure gas-distillate well. On 10-hour test, the well flowed 296 b/d of distillate, with gas-oil ratio of 13,331:1, for an estimated rate of 3.9-million cu. ft. of gas daily. Bottom hole pressure was 12,700 psi., tubing pressure while flowing was 9,200 psi., which increased to 9,700 psi. when shut in.

Pennsylvania—First natural gas discoveries in the eastern Pennsylvania coal regions, in Lackawanna County, are reported by Transcontinental Producing Co. Four wells, now shut-in, will be able to supply 1.5-million cu. ft. of gas daily. Other details have not been reported.

Mississippi—Milner-White Oil Co. and Wilson Drilling Co. No. 1 Brown-Reynolds, section 27-5n-1w, Adams County, about 1 mi. north-northwest of the Courtland field, was completed to pump 168 b/d of 38-gravity oil through perforations at 6,665-67 ft. This is the second Wilcox sand discovery made in the state this year.

North Texas—Sam Boren No. 1 B. W. King et al, section 1954, TE&L survey, Young County, was dually completed as a discovery in the conglomerate and as a confirmation to a recent Strawn discovery. The well flowed 242 b/d of 43-gravity oil through 16/64-in. choke from perforations at 2,975-83 ft. in the conglomerate, and 292 b/d of 43-gravity oil through 16/64-in. choke from perforations at 3,002-10 ft. in the Strawn.

Nebraska—Guy F. Atkinson and associates No. 1 Hofmeyer, section 36-2n-17w, Harlan County, recovered 15 ft. of oil and gas-cut mud and 3 ft. of oil on 1-hour drillstem test at 3,261-76 ft. in the Topeka. The wildcat is about 75 mi. east of previously established production in the Salina Basin.

Colorado—Phillips Petroleum Co. No. 1 Mannel, section 27-1n-95w, Rio Blanco County, flowed an estimated 6-million to 7-million cu. ft. of gas daily on test. The wildcat, bottomed in the Weber, was drilled to total depth of 17,033 ft., to establish a new depth record for the state. Phillips plugged back 4,160 ft. and perforated at 4,043-86 ft. Top of Ft. Union is 3,816 ft., that of Mesaverde, 5,076 ft. The prospect is the first on the Powell Park unit.

Alabama—Robert B. Schlinder No. 2 First National Bank of Birmingham, Trustee, section 29-38s-8w, Walker County, is reported alternately swabbing and flowing oil. Total depth is 1,982 ft. A representative of the state geologist's office confirmed the report of North Alabama's first oil well.

Southwest Texas—Associated Oil & Gas Co. No. 2-F Cage, Brooks County, flowed 1.5-million cu. ft. of gas daily through 10/64-in. choke plus 136 bbl. of condensate per million on production test at 8,262-74 ft. The wildcat is 2 mi. south of production on the Cage Ranch.

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DEPT/Transportation & Storage

Next: Four Corners-West Texas Line

Construction will start soon on the 16-in. trunk line. It will enable Paradox Basin producers to move crude to the Gulf Coast by May, 1958.

Contracts are about to be awarded for construction of the second "outlet" for Four Corners crude—Texas New Mexico Pipe Line Co.'s 16-in. line from the Aneth field to Jal, N. M. (PW—Apr.5'57,p52).

The first "outlet" for the Four Corners crude—a 16-in. trunk line—now is edging its way westward from the Utah-Colorado-Arizona-New Mexico intersection, aiming at Los Angeles and west Coast refineries (PW—Aug.23'57,p32). The line, expected to start carrying crude from Four Corners' Paradox and San Juan Basins by early 1958, is owned by Gulf Oil Corp., Shell Oil Co., Standard Oil Co. of California, Continental Oil Co., Richfield Oil Corp., and Superior Oil Co.

Four Corners producers are now in the midst of an intensive drilling program (PW—Apr.19'57,p20). This year some 1,200 wells are expected to be drilled in the area—the latest major discovery in the U.S.

Texas-New Mexico Pipe Line is owned by The Texas Co., Sinclair Pipe Line Co., Tidewater Oil Co., and Cities Service Oil Co.

Texas-New Mexico officials now expect the first pipe deliveries to arrive sometime next month. The company has already cleared about 90% of the line's right-of-way from the Paradox Basin to Jal. And "if work goes according to schedule," one company official told PETROLEUM WEEK, "we should be well out of the high country before bad weather sets in."

The line is now expected to be completed in May, 1958.

At Jal, the 512-mi. line will connect with existing West Texas-to-Gulf-crude lines, and with the Basin Pipe Line System to Oklahoma.

The Basin System, owned by Texaco, Sinclair, Cities Service, and Shell, swings through North Texas, where both Texaco and Sinclair could transfer crude into their own lines to the Gulf Coast.

The Four Corners crude could also move from Jal to the Gulf Coast via Texas-New Mexico's 16-in. line or through the Rancho System.

Texas-New Mexico doesn't own a gathering system at Aneth. However, The Texas Co. has a 10-in. primary line and a 4-in. lateral gathering system there. Texas-New Mexico plans to purchase this system from Texaco.

Texaco discovered the Aneth field. Other producers now include Shell, Superior, Conoco, and Gulf.

Crude oil is now trucked 120 mi. from the Aneth field to a railroad and then shipped another 200 mi. to Salt Lake City refineries. Product lines from Salt Lake City then distribute gasoline and heating oils in the northwest.

The Texas-New Mexico line will have an initial capacity of 50,000 b/d. It will have two pumping stations—one at Aneth, Utah, the other at Bisti, N. M.

Both stations will use 1,200-hp., dual-fuel, engine-drive centrifugal pumps.

The company is planning to install 8-cylinder Cooper-Bessemer dual-fuel engines, Lufkin gears, and Bingman pumps.

The Bisti station will be operated by remote control from the Aneth station.

The speed of pumps at the Aneth and Bisti stations will be controlled by the line pressure.

There are no plans at present for carrying Bisti Black Rock field crude in the Texas-New Mexico line. But the pump station at Bisti makes such a tie-in an attractive possibility.

Both the Aneth and Bisti stations will be housed, due to the cold weather in the area. There will be a heating system in each of these stations.

While there will be no operating personnel at the Bisti station, several maintenance men will be stationed there.

At the Aneth station, in addition to the pumping equipment, an office and control room will be set up. These will be in a separate building from the pumping station.

There will be three 80,000-bbl. storage tanks at Aneth and three 120,000-bbl. tanks at Jal.

One problem the company engineers have to contend with is elevation and static head.

The elevation at Aneth is 4,450 ft., while the high point on the line—at the Continental Divide—is 7,200 ft. The elevation at Jal is only 3,500 ft. Pumping at the rate of 50,000 b/d, the line will have 500 lbs. pressure when it reaches Jal.

Two pressure reducing units—one at Mesa and one at Jal—will "keep the line packed."

The company plans to install a 6-in. pressure-reducing valve at both points.

Each valve will bring pressure down about 250 lbs. The Mesa valve will also have a small hydraulic system for lowering pressures automatically.

The line's capacity can be expanded to as much as 170,000 b/d. If and when the capacity increases toward this maximum, the need for pressure-reducing equipment will diminish.

Line "packing" without pressure-reducing equipment will take place when the line is running 84,000 b/d.

The 170,000 b/d capacity can be reached by adding a sufficient number of pumping stations.

As the capacity is expanded, pumps will be connected in parallel because of the high static pressure which must be overcome before the flow starts.

Cold-tar coatings will be used to combat corrosion. As added insurance, however, cathodic protection will also be used.

Texas-New Mexico "expects no unusual construction problems." In fact, one company official says his only worry at this point is housing for construction personnel during the laying of the second half of the line; for there are few facilities for housing in that area.

Nevertheless, the line has some rugged country to cross. The terrain is very rough for the first 30 mi. where the area is badly eroded. There are sharp breaks in the terrain caused by the drainage pattern.

After the line crosses the San Andreas mountains, there will be flat plains the rest of the way to Jal.

Contractors building the line will have to cross three rivers—the Rio Grande, the Pecos, and the San Juan. The 16-in. line will go under all three rivers.

There will also be a few overhead crossings above streams and gulleys in the rocky area.

The company is leasing its communication system. Texas-New Mexico considered building a communication system of its own, but decided it

would be more economical to lease.

The Texas Co. has already announced that it will build a gasoline plant to process gas from the Aneth field (PW—Aug.16'57,p22).

The plant will recover and market natural gasoline, butane, and propane. Residue gas will be marketed or used for secondary recovery purposes. It is believed that other producers in the field will participate in ownership of the plant.

A Texas-New Mexico official says that if Texaco can't find a local market for these products, they will likely be blended into the crude oil and shipped southward.

What's New
IN TRANSPORTATION

Initial capacity on the Four Corners-to-California pipeline will be 70,000 b/d, instead of 60,000 b/d, because of changes just incorporated into the line's design.

The line is scheduled for completion in January, 1958. Until now, Four Corners Pipe Line Co. could only estimate completion for "early 1958" (PW—Aug.23'57,p32).

•

Stockholders of Phoenix Mfg. Co., which owns Graver Tank & Mfg. Co., last week approved sale of all the parent company's assets to Union Tank Car Co.

The transaction, approved earlier by directors of both Union and Phoenix, calls for issuance of Union stock on the basis of 2.1 shares of Union for 1 share of Phoenix.

Graver is a leading fabricator of field-erected tanks. It has plants at Edge Moor, Del., East Chicago, Ind., Houston, and Fontana, Calif. The company also produces pressure and process equipment in all alloys.

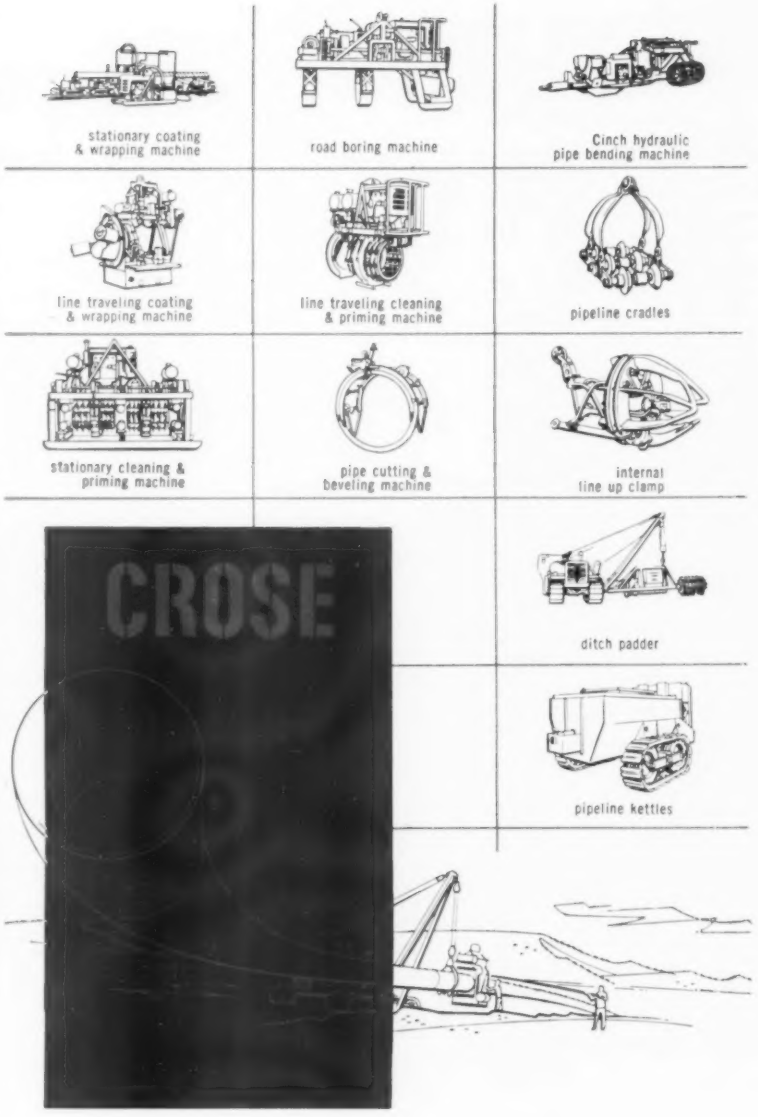
•

Republic Oil & Refining Co. has just opened a sixth terminal along the Plantation Pipe Line—this one at Doraville, Ga.

The Doraville facilities include tankage for 5-million gal. of gasolines and fuel oils.

Other Republic terminals that are along the Plantation Line are at Birmingham and Montgomery, Ala.; Columbus, Ga.; Belton, S. C.; and Knoxville, Tenn.

Republic is the marketing and refining subsidiary of Plymouth Oil Co.



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DEPT/Management

Well-Buyer Bets on More Inflation

A fast-rising Dallas oil company is testing how far you can go by concentrating on buying up proven oil and gas reserves. Since early 1955, Producing Properties Inc. has made a cash outlay of $7-million in this way. Expected eventual return: $40-million. And the stakes keep rising.

This month PPI's 47-year-old president, Robert J. Bradley, announced his firm's 22nd deal—the biggest one yet. This was the acquisition of 206 producing oil and gas wells on 17,000 developed acres in East and North Texas.

Acquired from Hollandsworth Oil Co., of Longview, Texas, and from its officers as individuals, were 6,600,000 bbl. of crude reserves and 16-billion cu. ft. of natural gas reserves.

PPI now has a total of 17-million bbl. in crude reserves and well over 100-billion cu. ft. of gas. The company is counting heavily on continued inflation to protect—and pyramid—these large underground holdings.

Much of PPI's expected future profit stems from the fact that the reserves were acquired for considerably less than their future potential worth. (Discounting of property values to offset the uncertainties of future production rates and oil or gas prices is standard practice in oil acquisitions.) In addition, inflation tends to raise the value of each barrel of oil.

Says PPI's Bradley, "Our large oil acquisitions are an exploitation of what we see as a long-term inflationary trend in the U. S. economy. We believe this influence will continue for years to come. One effect is that the payout time on properties purchased now will shorten as the inflationary forces expand."

Back in the fall of 1954 when PPI was founded, management decided to go all the way with its convictions on inflation. The paid-in capitalization of $10-million was tagged for amassing large reserves through property acquisitions. This program is now 70% complete.

"The investment of $7-million cash to date," says Bradley, "has created close to $40-million of future net revenues available to PPI after financing has been lifted. For every $1 paid out, the future revenue return will average almost $6. And we still have $3-million left to complete our initial program."

Favoring PPI's plan are the tax laws, which penalize the discoverer of reserves, and encourage him to sell out.

"Our large oil acquisitions are an exploitation of what we see as a long-term inflationary trend in the U. S."

ROBERT J. BRADLEY
President
Producing Properties Inc.

The company's policy is to finance most of the acquisition of property through bank production payments, in order to conserve equity capital. For example, the bulk of the purchase price of $7,050,000 for the Hollandsworth holdings was financed in this way. In its first two years of operation, PPI acquired properties totaling $15.8-million, of which $11.9-million was handled by production payment.

The company routes all its financing through the Republic National Bank of Dallas.

Management is not worried about the time it takes to pay off an acquired piece of property. Of much more concern in deciding the value and financing arrangements is a "high leverage" yardstick. To management, this simply means trying to get back, over the probable payout years, an income from the acquired properties equal to the equity capital put into the purchase.

Bradley observes that at times this "takes a lot of doing," and requires the most ingenious of financing arrangements.

The company spends $18,000 or $19,000 a month (about 4½% of its income) in appraising deals offered. One in 50 goes through. Using its own staff of eight engineers, a certified public accountant, and a tax attorney, PPI looks at a proposed purchase from all angles.

"When we get down to talking trade with a potential seller," explains Bradley, "we work very closely with him on all facets of his position. Naturally we hope to make a reasonable profit out of the deal. But at the same time we offer to the seller our full information and advice.

"This calls for lengthy tax studies, possible rearrangement of a seller's financial obligations, and in many cases assistance in establishing trusts. We do all of this if the trade is mutually advantageous."

In 1955 and 1956, PPI made 15 purchases while under contract management by today's President Bradley. In that first phase, PPI was headed by A. Knox Tyson, as president (he is the former president of American Republics Corp.). Tyson had been impressed with the operations of Bradley's San Juan Exploration Co., a firm organized in 1951 to engage in property acquisitions, contract management of properties, and consulting work.

Initially, San Juan Exploration was engaged in wildcat drilling. It drilled 23 wells with what Bradley calls "only moderate success." By 1954 its main activity had become property acquisition and contract management.

When PPI was formed, a contract was signed with San Juan Exploration under which the latter assumed PPI management on a fee and stock-interest basis.

Through 1955 and 1956, Bradley directed 15 purchases of properties in West Texas, East Texas, the Texas Gulf Coast, South Louisiana, and the San Juan Basin. One of these deals was a $5-million acquisition in West Texas, in which the total cost to PPI was $102,000.

Last year PPI consolidated its position by merging with San Juan Exploration, which brought along its

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". . . the only way to build an organization is to give the people who do the work a chance to share in the company's growth . . ."

WELL-BUYING starts on p. 36

own crude reserves of 996,000 bbl. and 1.9-billion cu. ft. of gas (before oil payments), plus other interests. Producing Properties Inc. emerged as the top company, with Bradley as president and Tyson as board chairman. Mac D. Oliver, Jr., and Virgil B. Harris, both long-time Bradley associates, were made vice-presidents.

Since April of this year, new acquisitions have added some 5½-million bbl. of crude reserves. Company net production is now up to 3,100 b/d of oil and some 20-million cu. ft. of gas a day. Most of the income from this output is applicable to production payments. PPI has other earnings from its contract-management of wells.

PPI's Bradley is a petroleum economist by training who values highly the experience he gained with the famed consulting firm, DeGolyer & MacNaughton. When he went on his own in 1950, Bradley was head of D & M's petroleum economics department.

Bradley got his schooling at the University of Missouri, Northwestern University, and the University of Oklahoma, finishing his studies in the midst of the depression. For a time he was a door-to-door magazine salesman in the Dallas-Fort Worth area.

Hitch-hiking to California, he entered the oil business in 1937 as a production clerk with Standard of California. In 1939 he went to the Middle East for two years for Socal. Then he returned for four years of World War II service as a Navy officer in the North Atlantic.

In 1946 Bradley went to Dallas, arriving, as he recalls, with his "wife, two young daughters, $400, and no place to live," to join DeGolyer & MacNaughton.

In directing PPI operations, Bradley is convinced a one-man-show doesn't work. Through the various organizational changes, he has kept a tight operation, built on the idea that "spirit and teamwork" make for success. All of his veteran associates are substantial stockholders in PPI.

"The only way to build an organization," Bradley sums up, "is to pay top salaries for top men, and to give the people who do the work a chance to share in the company's growth."

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DEPT/Refining

Well Solvents Hamper Reformers

New research shows that chlorinated solvents used to flush oilwells contaminate the crude and cause serious imbalances in reformer operations.

The results: shorter life for precious-metal catalyst, upset in product yield, and more corrosion. All these cost refiners a lot of money.

Refiners are asking producers for a change in well-treating technique, of all things, to help lower processing costs.

The use of chlorinated solvents in oil fields is what processors are objecting to. Such solvents are finding growing use in well-treating—primarily to dissolve and control paraffin composition in tubing and flow lines.

Why are refiners concerned? A team of Sun Oil Co. researchers, J. A. Guthrie and P. S. Hepp, last week released the findings of studies they've made on the way such oil field use of chlorinated solvents can affect refinery operations:

There's a definite connection between these seemingly remote operations, according to Sun Oil Co. researchers: Organic chlorides used in well-treating are carried in the crude to refineries where they cause serious difficulty in operation of cat reformers.

Some solvents contain only 30% to 40% of chlorinated hydrocarbons, while others, like carbon tetrachloride, reach 90% in chlorinated hydrocarbon content. Such hydrocarbons, however, are mainly concentrated in the boiling ranges of crude fractions used as reformer feed (boiling range from 100 F to 400 F). Therefore, even small concentrations of these solvents will have an effect on the composition of reformer feed. And during reforming, chloride concentration increases.

Such an increase results in a fundamental imbalance which has serious and harmful effects.

Reformers use a "dual function" catalyst containing platinum to promote formation of high-octane aromatics, and an acidic material—such as chloride—to promote cracking of long paraffin chains (low-octane) to smaller chains (higher octane). These cracking reactions promoted by the acidic material also cause coke formation and catalyst deactivation; they must be carefully controlled because of the high catalyst cost.

At reforming temperatures and pressures, and in the presence of platinum, the organic chlorides in the feed make for excessive acid function.

The life of a precious-metal reforming catalyst is seriously reduced by such uncontrollable organic chloride in reformer feed.

The excessive acid function brought on by the organic chloride in the reformer feed results in excessive cracking. This in turn, means too-rapid coking and faster catalyst deterioration. The precious-metal catalyst, instead of lasting several months—as it must if costs are to be kept in check—has to be regenerated or renewed much sooner.

Just as important, the resulting upset in product yield can cost plenty—up to $30,000 a month in a normal size reformer, Guthrie and Hepp estimate.

Maximum yield of high-octane reformate is obtained only when the two functions of the reforming catalyst (platinum and acid) are in proper balance. Any shift in this delicate system results in degradation of liquid products to gas. Excessive chloride in the feed can cause serious loss of selectivity, and reformate recovery can drop 3% to 5% in a few weeks.

Over-concentration of organic chloride can also cause serious corrosion problems in the reformer—and in other refinery equipment.

Once the organic chlorides are converted to hydrochloric acid in the reformer, Guthrie and Hepp point out, it is possible for the acid to pass through a variety of refinery equipment and cause extensive corrosion, with accompanying rapid equipment failure, particularly where moisture is present.

The Sun studies report that one "five-gallon treatment"—the amount generally prescribed to treat a well—can contaminate up to 30,000 bbl. of crude with sufficient organic chlorides throughout "to damage severely catalytic reforming operations and affect over-all refinery operations." When this treatment is carried out in a large number of wells, a refiner's entire crude supply can be contaminated—with a huge loss to the refiner, Guthrie and Hepp contend.

Ironically, carefully controlled amounts of chloride are commonly used to promote reforming reactions.

When such a promoter is used, the concentration is carefully regulated, taking into account trace concentrations of the chloride present in the (uncontaminated) feed—generally two parts per million or less. Such promoters induce isomerization and hydrocracking, thereby increasing octane rating. However, concentrations of chloride above five parts per million result in considerably more cracking than can be tolerated. "Promoter" dosage is watched closely to see that chloride concentration doesn't reach that point.

In contaminated reformer feed, however, chloride content has been measured at as high as 70 ppm.

Chloride in the feed stream is another story completely. And once it is in the feed, refiners find it economically impractical to remove.

Absorption, desalting, and caustic soda treating, Guthrie and Hepp conclude, are all ineffective. Hydropretreating would do the job, but some refineries don't have hydropretreaters; and to get one solely to protect against an oil field additive would be mighty expensive—up to $1.5-million.

Plants that do have pretreaters run the risk of corrosion in the stripper section and later in the gas plant in treating for removal of feed chloride.

As a result, Sun suggests that producers use well-treating agents other than chloride solvents. This, the company says, would nip the problem in the bud.

Guthrie and Hepp put it this way: "Elimination of the use of chlorinated solvents at the oil field is the only way to prevent recurrence of this problem."

Their suggestion: use of additives or solvents containing only hydrocarbons. "For instance, paraffin deposition can probably be controlled with aromatic hydrocarbons which are not harmful to refinery operations."

Sun has already begun to control its crude chloride contamination by getting producers to agree to stop using the chlorinated solvents in their wells.

Research Without Big Investment:

Refiners Rent Radiation Facilities

Researchers who need to investigate radiation's possible impact on processing—without spending a lot of money—can now use for-hire labs.

There's new opportunity for research on the possible effects of radiation in petroleum processing, thanks to the growing availability of rental facilities for such work.

The for-hire radiation research facilities are growing in number around the country. They are a direct, if delayed, offshoot of the post-war boom in nuclear research. In the past few years, several companies have been formed with the basic purpose of providing—on a fee basis—facilities for investigation of the effects radiation can have in processing food, plastics, chemicals, petroleum, and other materials.

Rental of both radiation sources and laboratory equipment for research work is becoming increasingly popular.

Applied Radiation Corp., for instance, is making available several high-voltage linear electron accelerators for research in radiation chemistry. This California manufacturer of large linear accelerators recently completed a new laboratory at Walnut Creek, Calif., where several clients are already studying the effect of radiation on their respective products.

The company also has plans for setting up "radiation centers" in various parts of the country.

Other firms now providing both radiation sources and lab facilities for such research are Radiation Applications, Inc., of New York, and High-Voltage Engineering Co. of Boston.

Companies that can't afford to buy radiation facilities of their own—some independent refiners, for instance—will find such rentals attractive.

Radiation equipment is, of course, expensive. For many refiners, especially smaller ones, investments of the size necessary for such equipment is just out of the question. Still, these refiners must know how radiation is likely to affect future petroleum processing. The rental facilities in many cases provide the solution to this problem.

Other firms, contemplating investment in radiation research facilities, can use such rental facilities for pilot work.

Sinclair Refining Co., for instance, used the facilities of Radiation Applications for some of its early radiation research. Sinclair later decided to build a special laboratory of its own for such work. The lab was recently opened in Harvey, Ill. (PW—Apr. 19'57,p50).

Standard Oil Co. (Ohio) also did early radiation research at Radiation Applications. Sohio later entered a six-company cooperative agreement for establishing radiation research facilities.

The Lummus Co., designer and builder of petroleum, petrochemical, and chemical plants, has also used the rental facilities of Radiation Applications.

M. W. Kellogg Co. is currently doing radiation research at Applied Radiation's Walnut Creek lab. And Richfield Oil Corp., another user of Applied's facilities, is known to have initiated "catalytic reactions of an organic type" in such facilities.

The representative of one large processing company, not yet "committed" to buying radiation research facilities, told PETROLEUM WEEK this week, "These rental facilities are essential to us. We're thinking of investing heavily in equipment to study radiation's effect in petroleum processing. But we want to try a few experiments on a small scale and see whether we'd be doing the right thing. Right now it looks like we should go ahead and buy.

"But we want to make sure, so we'll do some more work in the rented facilities."

Such research is becoming more important because radiation is being used with increasing success in helping to induce processing reactions.

No one is using radiation as a commercial process tool; it's still "on trial" in the labs. But it's becoming increasingly apparent that radiation may some day be used as a processing variable—along with temperature, time, pressure, and catalysts.

Radiation appears to have special promise in helping to induce polymerization reactions.

Dr. Ralph L. Rogers of Atlantic Refining Co. recently told an audience that experiments at his company's laboratories, using radiation, have been reasonably successful in converting butane molecules to octane by polymerization.

Other experiments are being carried on to improve radiation-induced conversions in cracking, alkylation and condensation of paraffins and aromatics, as well as in other areas of processing.

New Aid For Gauging Avgas Specs

A new method for estimating net heat of combustion—important in aviation gasoline specifications—is now available to refiners.

The National Bureau of Standards has developed a formula which relates heat of combustion to avgas composition. A statement of net heat of combustion is required for most aviation gasoline contracts.

The new estimation method could be a help to small refiners who do not have the necessary equipment to make accurate heat of combustion determinations. However, most military avgas specifications now require a bomb calorimeter determination of the heat of combustion figure. Unless this requirement is changed, the new method will be of value only in preliminary estimations.

The method involves analyzing for four hydrocarbon types in the fuel and plugging these values into an empirical equation. Standard ASTM silica gel absorption breaks the avgas into saturates and unsaturates. Further analysis divides the fuel into its four types: paraffins, olefins, napthenes, and aromatics. These four weight percentages are plugged into the empirical formula; a desk calculator can then supply the heat of combustion estimation.

Strict limitations on the composition of aviation gasoline is the basis for the new method. Specifications require that composition within each of the four hydrocarbon types be restricted to a small group of related compounds.

Reliability is greater with this method than with other estimating procedures.

However, the Bureau's method requires a more complicated analytical technique than other estimating methods. The procedure, although developed for the Air Force, is available to the oil industry.

What's New / IN REFINING

Weigh New Studies On H-Bomb Energy For Power

Standard Oil Co. of California may soon back new, large-scale research to study what effect the thermonuclear power of the hydrogen bomb could have on the demand or fossil fuels.

California Standard's wholly-owned subsidiary, California Research Corp., is considering sponsoring a multi-company development program on the thermonuclear reaction of the hydrogen bomb. Information from such research—with restricted Atomic Energy Commission data recently made available to California Research—could be "important to California Standard's future plans in the oil business."

A. L. Snow, vice-president of California Research, says that such information would help the company project requirements for petroleum, oil shale, and other fossil fuels as a source of supply for the future power needs of the world.

"In this projection and planning," Snow explains, "the relative proportion of power which may be supplied by controlled thermonuclear reactions is a significant and important factor."

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Cities Service Building First Canadian Refinery

Cities Service Oil Co., Ltd., has begun construction on its first refinery in Canada, a $27-million plant at Bronte, Ont.

The refinery, scheduled for completion in January, 1959, will have a capacity of 20,000 b/d. Crude will be delivered to the plant from Alberta fields through the Inter-Provincial Pipe Line.

R. J. Hull, president of Cities Service Oil Co., Ltd., says that by the time the refinery goes on stream, the company will be fully integrated in Canada. Cities Service is now increasing exploration and drilling in Alberta, and is spending $8-million to expand its marketing facilities in Canada.

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California Oil Co. is building a new hexane fractionator and is revamping a crude still at its Perth Amboy (N. J.) refinery. Construction in both jobs got under way last week. Both are scheduled for completion in late December.

The hexane fractionator will have a capacity of 9,700 b/d. Besides making a high-octane gasoline component, it will produce normal hexane, which will be treated to make a commercial solvent. California Research Corp. designed the unit.

The M. W. Kellogg Co. is building the hexane fractionator and revamping the crude unit.

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Independent refiners have asked the Defense Dept. to carry out gradually the recently-announced cutbacks in military petroleum purchases to save them from serious economic hardship.

The Independent Refiners Assn. of America made the request to Charles E. Wilson, retiring Secretary of Defense, last week. Elmer Batzell, IRAA counsel, asked for a planned and orderly manner of cutbacks because, he said, "independent refiners are vulnerable to thoughtless and abrupt changes in peacetime orders by the government."

He suggested that since the proposed curtailment is for the entire fiscal year, it should be carried out "in a staggered manner over the remaining 10 months, without . . . excessive curtailment now."

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Wainright Producers & Refiners Ltd. will boost gasoline capacity 100% and diesel capacity 80% with new equipment at its Wainright (Alta.) refinery. Ralph M. Parsons Co. will design a whole series of new units for the 4,500 b/d plant, including a thermal cracker, a cat reformer, a polymerization plant, and a desulfurization unit.

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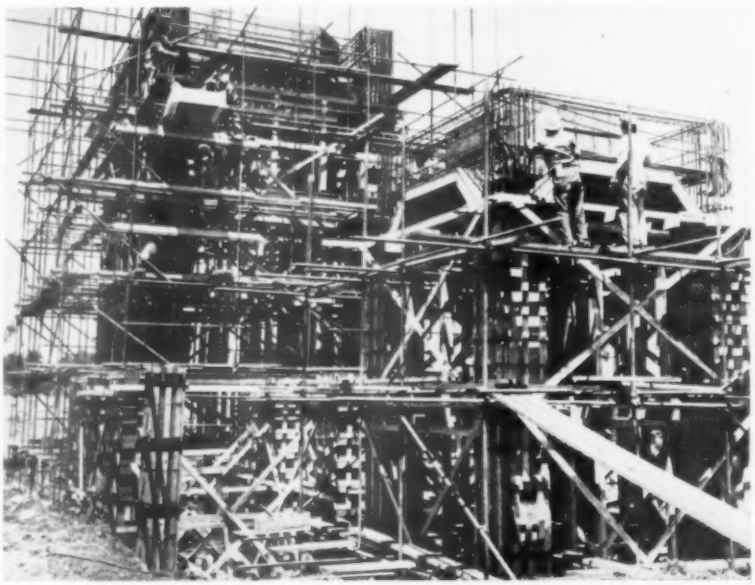
Sulfur recovery from Humble Oil Co.'s Baytown (Tex.) refinery gases is being doubled.

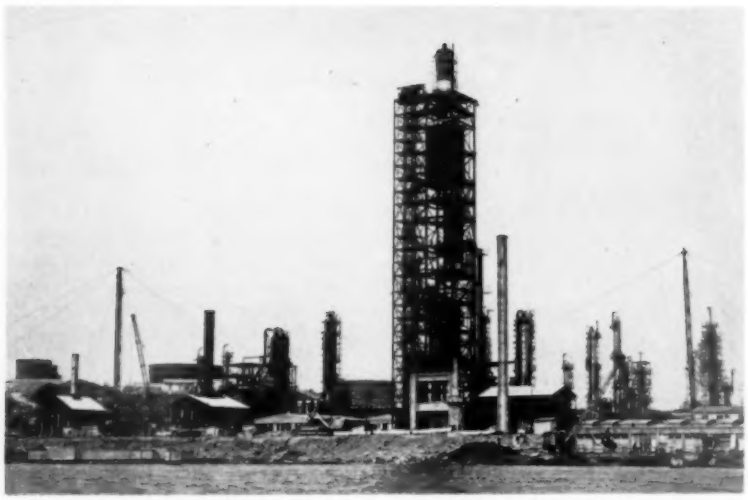
Sulfur is recovered from the refinery gases at an adjacent plant of the Consolidated Chemical Industries division of Stauffer Chemical Co. Consolidated says it now must double its plant capacity in order to handle a recent increase in the amount of refinery gas produced at Humble-Baytown.



Clark Lays Foundation for Cat Cracker

It doesn't look like much now, but by early next year this concrete foundation will be supporting Clark Oil & Refining Co.'s new 12,500 b/d fluid cat cracker. The unit is part of a $7.3-million expansion program now under way at Clark's Blue Island (Ill.) refinery.

The cracker is being built for Clark by Procon, Inc., under license from Universal Oil Products Co. of Chicago.



NESTE OY'S NEW REFINERY will be supplied 50% by Western companies, as . . .

Finland Starts Refining

HELSINKI—Finland's first refinery is now on stream with one long-standing point of controversy settled. Half of the crude for the 17,000 b/d plant will be supplied from the Middle East by Western oil companies. The other half will come from the Black Sea under Finland's trade agreements with the Soviet bloc.

The plant was designed and built by Lummus Co. for Neste Oy, a government-controlled oil storage company. It is located at Tupavuori, near the southwestern port of Turku, where Neste previously had terminal and storage installations.

Gulf and Shell are supplying 10% and 40%, respectively, of Persian Gulf crude under long-term contracts with Neste Oy. The Black Sea crude will come from Soviet Tujmaza.

The contracts with Gulf and Shell are still under negotiation, but are expected to be concluded soon.

Esso, as well as Gulf and Shell, will participate in distributing the plant's products within Finland. The three companies are all established marketers in the country, together accounting for about 70% of its product distribution.

When construction of the refinery was started in 1955, it was an open question whether any of the crude would be supplied by Western sources —or whether they would market any of its products.

At that time, Finland was importing 80% of its product needs from the Soviet bloc, due to severe foreign exchange difficulties. Only 20% was coming from Western sources, as compared with 87% in 1947.

Pending improvement of Finland's currency position, the Western companies had originally agreed to handle Soviet products. But Esso took a firm stand against marketing Rumanian products as well, when the government subsequently concluded a further oil import agreement with that country (PW—Oct.21'55,p26).

Lummus Co. originally designed the new refinery to handle both Middle East and Black Sea crude. Now the two crudes are fed mixed in 50-50 ratio.

Total cost of the refinery is about $21-million, excluding a $3.9-million Finnish purchase tax on machinery and equipment. It also excludes the jetty and some storage tanks that were in existence when construction began.

Equipment for the new refinery was supplied by French and German subcontractors. Cie de Fives-Lille, the French firm, handled about 60% of the equipment. The remaining 40% was supplied by the German firm, Mannesmann Roerbau GmbH. Special equipment items were imported from the U.S.

The new refinery is equipped with modern processing units.

These include: an atmospheric vacuum and distillation unit; an asphalt vacuum and oxidation unit; a Socony Mobil Thermofor catalytic cracking unit, with a fresh feed charge of 6,000 b/d; an Atlantic catalytic reforming unit (Catformer), with a total charge of 3,400 b/d; a California Research catalytic polymerization unit; and an electrical desalting unit. It also has the necessary units for vapor recovery, solid copper chloride sweetening, and double caustic and inhibitor treating.

The entire instrument control system and leads are all electronic.

There are few instances of this in present-day refinery operations. Commonwealth Oil & Refining Co.'s plant in Puerto Rico is reportedly the only other refinery in the world so equipped.

An American firm, Manning, Maxwell & Moore, supplied the electronic equipment for the Neste refinery.

The plant is now operating at 90% of capacity.

In the first full year of operation, the plant is expected to produce 284,700 bbl. of LPG, 2,226,500 bbl. of gasoline (premium and regular), between 175,200 bbl. and 182,500 bbl. of tractor fuel, 1,307,500 bbl. of diesel oils, 1,307,500 bbl. of fuel oils, and 35,000 tons of asphalt.

The plant's output will meet only about half of Finland's fast-growing, and changing, oil demand.

This year's total demand is estimated at 38,000 b/d, a 15% jump over 1956. And demand for fuel oils, in particular, is growing rapidly.

The refinery will produce a surplus of LPG for the initial demand in Finland, however. Some progress has been made in disposing of it, with a few industries planning to switch to LPG in place of other fuels. One factory that produces margarine and operates a grain mill a few miles from the refinery will receive the product direct through a special pipeline.

The outlook has brightened for the Western marketers this year, though the picture is not unclouded.

An estimated 48% of Finland's total oil demand is expected to come from Western sources—the highest percentage in ten years.

But it is not certain that this ratio will hold in the face of a serious foreign trade crisis. Finland already has an embarrassing surplus of rubles, for which it may try to get more coal and oil from the satellite countries. At the same time, it is also short of Western currencies.

On the other hand, the satellites have demanded—and are getting—Western currencies for some of Finland's fuel imports: Poland, £4-million for coal, and Rumania an unknown sum in Swiss francs for oil.

An Arabian Wildcat to Watch

The first exploratory test of central Saudi Arabia's oil potential, now under way, will be drawing widespread attention.

Arabian American Oil Co. spudded the wildcat on Aug. 2 at Khurais (map, above) as part of its program of evaluating the central interior of its concession.

Aramco locates the site as approximately 78 mi. west of Udhailiyah, an installation midway between the Uthmaniyah and Huiva areas of the fabulous 152-mi.-long Ghawar field.

Results of the test may provide a significant clue to the oil prospects of the adjoining preferential area around Riyadh—in which other oil groups are interested.

This area is not under concession to Aramco. The company does, however, have preference in acquiring rights to the acreage, a half-moon-shaped area with Riyadh marking the north-central part of it.

Several American groups, including the Conorada companies and Indiana Standard, are interested in Saudi Arabian oil rights (PW—Aug.16'57,p17). So are the Japanese.

The areas of greatest interest are the offshore acreage for the Saudi Arabia-Kuwait Neutral Zone, and the preferential area around Riyadh. The companies are also taking a look at areas relinquished by Aramco.

Actually, the Khurais test lies within the 16-mi. to 46-mi. wide Dahana sands which border the preferential area, according to Aramco.

This strip runs about 310 mi. between Saudi Arabia's two great sand areas, the Rub al-Khali in the south, and the Great Nefud in the north. Its character ranges from rolling sands in the south to gravel patches in the north.

Aramco says its objective is to penetrate and test the equivalent of all known oil-bearing formations in Al Hasa, Saudi Arabia's Eastern Province.

Present Aramco wells have been drilled into formations of the late Paleozoic era, Permian Period.

The new site was selected last November following gravity mapping and drilling of shallow structure holes. It is being drilled with the derrick used on the No. 1 Rub al-Khali stratigraphic test, which went to 14,875 ft., a record depth for the Middle East.

Total cost of the test will amount to almost $1-million. Aramco expects to complete it within six months.

Pemex Plans Natural Gas Line from South

MEXICO CITY—Petroleos Mexicanos is expected to sign a contract within the next month for construction of a $60-million pipeline to Mexico City that will tap its huge gas reserves in the state of Tabasco, southeastern Mexico.

Negotiations are now under way with several companies on what will be one of the biggest projects in Pemex's 19-year history.

The first leg of the 600-mi. line will be 18-in. pipe from the Jose Colomo Field in the Macuspana region of Tabasco to the Minatitlan refinery in Vera Cruz. From there to Mexico City it will be 24-in.

The first section is expected to be completed before President Adolpho Ruiz Cortines leaves office Dec. 1, 1958. And there is a possibility the entire project may be completed by that date.

As now planned, the gas line will pass through Puebla, fourth largest city in Mexico, over the Cortex Pass between Mexico City's famed volcanoes.

Industrial users will be the first consumers of the gas. This will help to solve a growing problem for Mexico's government oil monopoly, whose production of fuel oil has been falling behind demand. In addition to the consumers in Puebla and Mexico City, sulfur companies near Minatitlan also will use the gas.

The line will provide the first major outlet for Mexico's southeastern gas fields. Pemex is aiming for October completion of its 300-million cu.-ft.-per-day absorption plant at Ciudad Pemex, a small town it has built in the swampy wilderness of Tabasco, less than five mi. from the Jose Colomo field. Until the pipeline is built, the gas from the absorption plant will be reinjected to maintain underground pressure.

What's New / AROUND THE WORLD

First Export Outfit Is Set For Bolivian Oil

PARAGUAY—A European-American group will start work in November on construction of a 10,000 b/d crude oil line from Bolivia's southeast border to Asuncion—plus a 3,000 b/d refinery at its terminus (PW—Aug.9'57,p46).

The contract has been awarded by the Paraguayan government to a group of companies headed by Cie. Fices-Lille, the French engineering firm. This company will itself build the refinery, according to Michel de Commene, its Latin American representative.

The 422-mi. pipeline will be built by Termec-Hardeman Venezuela S.A., of Caracas, under the supervision of Paul Hardeman, Inc., of Los Angeles. Comptoir Franco-Belge des Tubes S.A. will supply 6⅝-in. pipe.

Total cost of the over-all project is $11.8-million, with $720,000 of this payable in Paraguayan guaranis at the rate of 100 to $1. Credit terms call for payment in five to seven years at sliding interest, with 40% payable in the first two years.

Construction is scheduled for completion in 18 to 24 months. The pipeline is one of several projected export outlets for land-locked Bolivia's crude (PW—Jan.11'57,p34).

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Mideast Pipelines Safe

SYRIA—For both economic and political reasons, Mideast oil men say, Syria's far-leftist army chiefs won't tamper with the pipelines that run to the Mediterranean from Iraq and Saudi Arabia—unless an emergency similar to the Suez crisis should arise.

Whether or not Syria gets Soviet aid, the Syrian economy badly needs the revenues from Iraq Petroleum Co. and Trans-Arabian Pipe Line Co. Syria will get some $20-million from IPC when normal flow is resumed through the lines Syria's army sabotaged last year. It also will get an estimated $4-million to $5-million from Tapline if agreement is reached on a proposed profit pool split among that line's transit countries.

Also, oil men believe that non-communist civilians still have some say in running Syria. They will do nothing further now to aggravate relations with the West, and particularly to anger King Saud, who is already fuming at the pro-communist turn in Syria.

Syrian intentions toward the pipeline operators will be clearer in September. Tapline is scheduled to send a team of American engineers to check corrosion and replace deteriorated pipe just inside Syrian territory from Jordan. This will have to be done in time for the projected expansion of Tapline's oil flow capacity.

Meanwhile, oil marketing firms in Syria last week reported increased absenteeism among local employees who fear that working for U.S. companies may tag them as spies.

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More Oil Bids Filed

BOLIVIA—Two more U.S. companies have applied for oil concessions in Zone 1, an open area north of the oil-producing zone reserved to the government oil company.

Bolivian Petroleum Corp. filed bids for five concessions totaling 1,144,900 acres. The company was recently incorporated in Delaware by U.S. interests yet unknown.

Cataract Mining Corp. requested four concessions totaling 283,500 acres.

Both bids are for exploration and subesquent exploitation rights. They were the first filed for open acreage since May (PW—May10'57,p70).

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PANAMA—United Fruit Co., now making its first entry into oil exploration, will seek contractors to develop a 1,061,000-acre concession bought last week from the Panamanian subsidiary of Time Petroleum Co., of Wichita.

The concession is located on the Pacific Coast in the province of Chiriqui, where United Fruit has some of its finest banana plantations.

United Fruit has already engaged Ball Associates as consultants. It will continue work initiated by Time, which recently completed general geological studies and aerial surveys. The concession calls for completion of seismic work within a year.

Time Petroleum disclosed that it has received a "substantial" cash consideration for the acreage, which it acquired last year from Cataract Mining Co. (PW—Nov.23'56,p33).

United Fruit will also pay a total of 4½% in overriding royalty interests to Cataract, Time, and Cia. Petrolera Urraca.

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ARGENTINA—Three U.S. engineering firms have submitted bids for expansion of the Lujan de Cuyo refinery in Mendoza province.

They are: M. W. Kellogg Co., Foster Wheeler Corp., and the Lummus Co.

The project will triple the refinery's capacity to 37,400 b/d by 1960. According to estimates by Yacimientos Petroliferos Fiscales, it will cost around $14-million plus 300-million Argentine Pesos. The expansion is part of the government's multi-million-dollar oil reactivation plan.

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BRAZIL—Petrobras announced the second of two new wildcat discoveries in eastern Brazil last week.

The latest find is on the northeast coast in the state of Alagoas. The wildcat, drilled for Petrobras by Haney & Williams Drilling Co., has been carried to 7,275 ft.

It produced 38 bbl. hourly of 41-gravity crude with strong gas pressure in a test at 5,136-46 ft. Its commercial value has not yet been determined.

Further to the south, Petrobras also has struck oil on a new structure in the Bahia producing region, according to Walter Link, exploration chief. The wildcat, recently completed in Bahia Bay, has been testing 50 bbl. hourly.

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INDIA—Standard-Vacuum Oil Co. is preparing to spud its second wildcat in West Bengal at Galsi, 35 mi. northwest of Burdwan.

Its first Indian test, No. 1 Burdwan, was abandoned 3½ mi. east of Burdwan at 8,921 ft. early this month before reaching its 10,000 ft. target.

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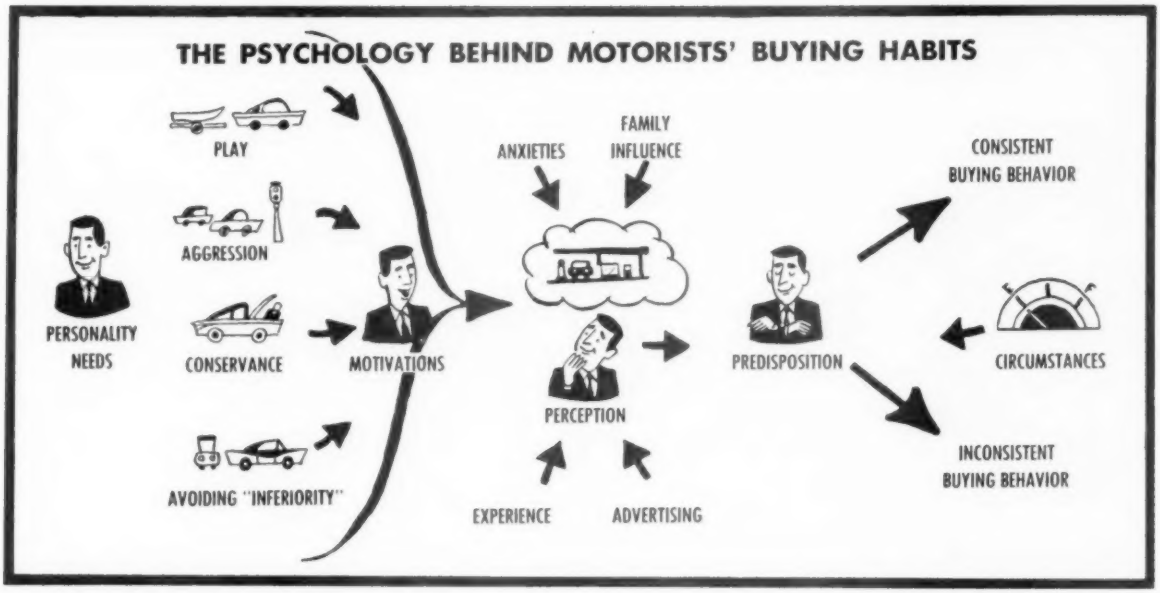
SAUDI ARABIA—New wage increases averaging an over-all 9% will add an estimated $2,340,000 to annual labor costs of Arabian American Oil Co.

The new pay rates were announced in Dhahran last week by Aramco president R. L. Keyes. They take effect Sept. 1 for more than 16,000 employees on Aramco's Saudi royal payroll. Individual increases range from 15% for basic labor jobs to 8% for highly skilled positions.



PERSONALITY NEEDS (left) fuse with other factors (center) to form motorist's buying behavior (right), showing . . .

How Emotions Shape Motorists' Buying

The motorist's emotions play a big part in his buying decisions at service stations. The main influences, according to a new DuPont survey, lie in four basic human needs: "play," "aggression," "conservance," and "infavoidance" (the need to avoid being considered inferior by others).

The findings in this survey, released this week by the Petroleum Chemicals Division of DuPont, are based on interviews with more than 2,000 motorists, selected on a scientific cross-section basis.

The survey revealed four key motivations behind motorists' use of a car, and consequently his buying patterns at service stations. Here's how the researchers define these psychological motives:

- Play need: the need to relax and to seek diversion or entertainment, as evidenced in vacation or pleasure driving.
- Aggression need: the need to get ahead or prove one's superiority. This need is manifested in the driver who must be first off at traffic lights, wants to pass all other drivers, and becomes angry when passed by other drivers.
- Conservance need: expressed in the desire to keep a car in good running order, to protect an investment.
- Infavoidance need: the need to avoid appearing to be a person of inferior position, qualities, or tastes.

These emotional needs—along with such additional factors as anxiety, family influence, past experience, and oil company advertising—act on the motorist's perception of a station. This determines his predisposition to buy or not to buy. At times, however, his buying pattern may be altered by immediate circumstances—such as an empty gas tank or turnpike driving.

Summed up, these additional factors are: (1) anxieties about products and services; (2) family influences, such as husbands who tell their wives what service station products to buy; (3) past experience—a motorist equates a bad experience at one station of a particular brand as typical of all stations of that brand, the same carry-over holding true with good experiences; and (4) advertising, as seen in motorists' "playback" of advertising themes in discussing certain products.

The motorist buys a gasoline that he expects will deliver the most power and acceleration, and thus satisfies his aggressive need. His desire for pleasant, trouble-free driving is also important.

When asked to rank the various attributes they considered important in gasoline, motorists put grade—premium or regular—at the top. Next was whether or not the gasoline was high-octane. Next in importance was "cleanliness and purity"—considered by DuPont's researchers to be a playback of advertising.

In terms of performance, the most important attributes are power and acceleration, mileage, quick starts, and smooth running.

In view of these findings, DuPont suggests that advertising themes emphasize "power," "acceleration," and "pleasant, trouble-free driving."

The need to conserve his car is the primary factor in a motorist's choice of motor oil and grease. He also has a high degree of anxiety about the quality of motor oil and the service he gets in oil changes, tire repairs, and lube jobs.

The motorist's chief concern in buying motor oil is to keep his auto in good running order. To a lesser extent, he is seeking trouble-free operation in using his car for recreation or aggression. Advertising themes, says DuPont, should be pitched on "protection of parts," or "trouble-free operation."

Motorists have certain anxieties about both product quality and services, says DuPont. And there is a significant difference between the anxiety levels expressed by men and women. Women appear to have a "generalized anxiety" about all products—possibly

because they have less knowledge of the technical aspects of a car. On the other hand, men are more selective than women.

Men and women both express the most anxiety about the quality of motor oil. Tires come second, but higher up on the scale for women than for men. Women place grease, gasoline, and batteries not far down the scale. Somewhat further down the scale, men ranked gasoline, grease, and batteries.

Men are most worried about oil changes, somewhat less about tire repairs and lube jobs. Putting in batteries and gasoline are least worrisome. Women are most anxious about tire repairs, with oil changes close behind.

In buying TBA items, one of the primary motivations is the motorist's desire to "make a deal"—and thus express his feelings of superiority, achievement, and recognition. He looks for the best price, and also for a place where he'll get a quality guarantee, says DuPont.

About 55% of motorists are predisposed to buy new tires at places other than service stations, the survey finds. Some reasons given for not buying at service stations: higher cost, lower trade-in value, and less selection.

Some also feel that they get better quality tires and better credit deals elsewhere.

About 38% of motorists surveyed are predisposed to buy batteries at locations other than stations, but there seems to be less motivation to "make a deal."

About 11% of motorists are predisposed to buy antifreeze elsewhere—either because of lower cost or because "it's just as easy to buy it elsewhere and put it in the radiator myself."

The human desire for a feeling of superiority also crops up in the motorist's motivation for choosing premium over regular gasoline, says DuPont. In talking about the differences in grades, 72% spoke in terms of performance, rather than the product itself.

About 47% of the motorists are predisposed to buy premium, 37% to regular, with the rest giving varying answers. Women rate premium higher than men.

The reasons given for buying regular: "good enough for my car," "cheaper," "car runs better," or "my car is old or small."

Top reasons for premium buyers: "car runs better," "better mileage," "better pickup, power." The motorist will buy premium to get better mileage, notes DuPont, even though it would take a lot of mileage to justify the higher price. This is evidence of the motorist's desire to bolster his ego by making a deal, says DuPont.

In spite of the fact that 76% of motorists say that major brands of gasoline are alike, 72% stick to one brand. DuPont attributes this seeming paradox to the fact that three-fourths of one-brand motorists buy at one station—for convenience, personnel, good service, or credit arrangements. One-fourth of one-brand motorists buy from several stations. They indicate that their buying pattern is based on satisfactory experience with a product, rather than any deep conviction that it is a superior product.

For this reason, the individual station is one of the best promotional avenues for an oil company, says DuPont. And here's how motorists rank the things they look for in stations, in order of importance:

- In day-to-day driving: kind of attendant, ease of entry, kind of lube job, price of gas, mechanic available, general appearance, clean rest rooms, credit, and tire repair.
- In trip driving: clean rest rooms, ease of entry, general appearance (his only basis for judging an unknown station), and price of gasoline.

Motorists place promptness of service as the most important attribute in station attendants. Next come checking oil and water, treatment of car (whether they slam the hood, or slop grease and gasoline around), friendliness, knowledge of cars—and least important, attendant's clean appearance.

Major company stations tend to be alike, say 77% of the motorists. Nevertheless, 55% of these buy at one station—further emphasizing the importance of the individual station.

Promotion aimed at women drivers should try to make them feel more at ease in a station atmosphere and emphasize prompt service, since women generally are "out of their realm" in station surroundings.

Ease of entry makes a big difference to women, as do clean rest rooms and prompt service. Attendants should give women a feeling of confidence in their efficiency and knowhow.

However, DuPont cautions against putting too much emphasis on promotion aimed at women drivers on the grounds that women are only one-quarter of the buying public at stations, and most wives who drive follow their husbands' "orders" or suggestions in station buying.

Marketers who favor credit cards could push them harder, says DuPont. The reason: 59% indicated a favorable reaction to credit cards, but only 18% said they hold cards. One-fourth of those surveyed were unfamiliar with credit card systems or didn't know whether or not they were in favor.

Credit arrangements lead motorists into patterns of brand-buying. Therefore, oil companies should capitalize on credit cards as a means of helping to establish these patterns, concludes the survey.

What's New
IN MARKETING

NCPR Stand Opposed

The National Congress of Petroleum Retailers wound up its eleventh annual meeting last week—further from agreement on how best to tackle supplier-dealer differences than when it started.

The meeting, held in Cincinnati, closed with a vote for a "tough attitude toward majors." However, it met with some serious opposition: Samuel Rosenwasser, of Brooklyn, a vice-president since 1953, announced that he will urge his group (The Gasoline Merchants of Brooklyn) to pull out of NCPR. He declined a nomination for a vice-presidency, saying:

". . . What have we accomplished? Nothing. We come to these meetings and wrangle and fight.

"We do not work within the industry we are part of. Isn't it the first promise to talk with your opponents?"

In an earlier meeting, Rosenwasser's defense of the American Petroleum Institute's service station advisory committee was met with boos and silence. NCPR voted to prohibit members from speaking in its behalf when participating on the API committee.

Other highlights of the meeting:

- NCPR recommended a wait-and-see policy on pending antitrust actions before taking further action to support divorcement legislation.
- A national clearing-house to supply members with trading-stamp information was proposed.

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Gasoline sales at Cities Service stations on the New Jersey Turnpike last week passed the 100-million-gal. mark. The total volume—sold between November, 1951, and August of this year—represents enough gas to fuel an average family car for 153,610 years.

The first half of 1957 brought more than 18-million revenue vehicles to the turnpike, 35.2% above the same period in 1956. The New Jersey turnpike Authority expects a 1957 traffic total of 40-million vehicles.

W. D. Walser

L. K. MacFarland

W. D. WALSER and **LELAND K. MacFARLAND** have been elected presidents of the Houston and Oklahoma controls (chapters), respectively, of the Controllers Institute of America. Walser is vice-president and controller of Tennessee Gas Transmission Co.; MacFarland is secretary and treasurer of Kingwood Oil Co., Oklahoma City. Other new officers of the Houston chapter are **Joe B. Cook,** vice-president-finance and treasurer, Woodley Petroleum Co., vice-president; **Fred H. Tschirgi,** assistant secretary-treasurer, Johnson Testers, Inc., secretary-treasurer; and **E. E. Hunter,** assistant comptroller, Humble Oil & Refining Co., a director. Other new officers of the Oklahoma chapter are **J. A. Carlson,** controller, Kewanee Oil Co., Tulsa, vice-president; **Bert Edwards,** comptroller, Carter Oil Co., Tulsa, secretary; and **Howard W. Blauvelt,** assistant controller, Continental Oil Co., Ponca City. **John C. Bumgarner,** controller, D-X Sunray Oil Co., Tulsa, and **Arthur McLawhon,** vice-president-comptroller-treasurer, Republic Supply Co., Oklahoma City, all directors. In Dallas, **Duren W. Holder,** treasurer, British-American Oil Producing Co., is the new vice-president of the local chapter, and **Robert E. Hill,** comptroller, United Gas Corp., a director. **J. A. Ross,** Shell Oil Co. of Canada, Ltd., Toronto, and **Edward G. Sommer,** assistant treasurer, Standard Oil Co., Inc., Louisville, Ky., have been elected vice-presidents of their respective controls. Elected directors of controls in their respective areas are **W. Joseph Arnold,** assistant vice-president and comptroller, Pure Oil Co., Chicago; **E. H. Brown,** vice-president and treasurer, Clark Oil & Refining Corp., Milwaukee; **Kenneth M. Leask,** comptroller and assistant treasurer, Trans Mountain Oil Pipe Line Co., Vancouver; **C. J. Millar,** International Petroleum Co., Ltd., Coral Gables, (Florida control); **George E. Pierce,** controller, Buckeye Pipe Line Co., and **Melville J. Roeder,** Standard Oil Co. (N. J.), both of New York (Long Island control); **Charles W. Plum,** assistant controller, Standard Oil Co. (Ohio), Cleveland; **J. Gordon Ross,** controller, Northwestern Refining Co., St. Paul Park, Minn. (Twin Cities control); and **O. Pendleton Thomas,** vice-president, Sinclair Oil Corp., New York.

HAROLD J. KLEEN has been named to the newly created position of land manager of the geological and geophysical departments of Kerr McGee Oil Industries, Inc., Oklahoma City. He was formerly chief geologist. **Walter Marlin** becomes special assistant to the vice-president of exploration. Newly appointed exploration department personnel reporting to Kleen are **Ralph H. McVay,** superintendent of the land department; **C. R. Washburn,** assistant superintendent of the land department; **L. W. Curtis,** regional geological manager of the central and Rocky Mountain divisions, and the Panhandle district; **J. A. Masters,** regional geological manager of the southern, West Texas-New Mexico, and Canadian divisions; **D. L. Amonett,** chief geophysicist. **R. E. Anderson** will replace McVay as superintendent of the lease records department, and **Marvin Lacy** becomes assistant superintendent of the department. Masters is being replaced as divisional geological manager in Calgary by **R. L. Duncan.**

WILLIAM B. FARLEIGH is the new Pure Oil Co. scout in Durango, Colo. He succeeds **Bert Bowen,** who has been transferred to Casper, Wyo.

JOE A. KEEPERS is the new senior project specialist in the development department at Texas City, Tex., of the Lion Oil Co. division of Monsanto Chemical Co. Keepers has been project specialist in the research-development department of the plastic division, at Texas City, since 1953.

A. P. LaBARGE is Tuloma Gas Products Co.'s sales representative in its newly established district office at Russell, Kan. He was formerly located in the company's Tulsa general offices. The new Kansas office is part of the company's LP-gas marketing expansion program.

ARTHUR R. SMITH is the new executive assistant of Pacific Petroleums Ltd., Calgary. Smith's oil experience began in 1937 with the Turner Valley field. Since then, he has been associated with two independent oil companies, and was an oil publisher for a four-year period. Recently, he has been elected to the House of Commons as Conservative Member for Calgary South.

ROBERT E. FRANCE has been named superintendent for The California Co.'s new South Louisiana production division, in Harvey, La. He will supervise production operations in the Barataria, Delta Farms, and southwest Louisiana areas. **Delbert D. Jackson,** formerly assistant superintendent in the Gulf Coast division, succeeds France as North Louisiana-Mississippi division superintendent, in Natchez, Miss. The Gulf Coast division has been divided into the new Delta-Gulf Coast and South Louisiana divisions.

CHARLES SANDY has resigned as geologist for W. C. McBride, Inc., to open consulting offices at Evansville, Ind.

LOUISE SHERRILL of Brewster-Bartle Drilling Co., Houston, has been elected 1957-58 president of the Desk & Derrick Club of Houston. Other new officers are **Cleo Hopkins,** first vice-president; **Grace H. Haggard,** second vice-president; **Marie Gummelt,** recording secretary; **Patricia J. Gallagher,** corresponding secretary; and **Lou Brown,** treasurer. **Ida B. Griffith** will serve as board advisor. Newly elected directors who will serve two-year terms are **Chris Fowler, Margaret Gust, Earlene K. Monroe,** and **Rosa Lea Spaugh.**

TOM BENTON, WALTER MOODY, and **ELMER CLARK** have formed Planet Engineers, Inc., Durango, Colo., a new consulting petroleum engineering firm to serve the Four Corners area. Benton has been a senior petroleum engineer for General Petroleum Co. since 1953; Moody was a petroleum engineer with Seaboard Oil Co.'s western division; and Clark was a senior surveyor for Shell Oil Co. The company will offer services including aerial and conventional surveying, petroleum engineering ranging from development to evaluation work, and production management.

EARL G. GRIFFITH has joined Wm. Ross Cabeen & Associates, Denver. He was formerly exploration manager for the Denver district of Tennessee Gas Transmission Co.

W. M. RIDDLE has joined Home-Stake Production Co., Tulsa, as geologist for Kansas. For the past six years, he has been a geologist for Pure Oil Co. in Oklahoma, Colorado, and Kansas.

O. C. CLIFFORD, JR., chief geophysicist of Atlantic Refining Co., Dallas, is the new president of the Society of Exploration Geophysicists. He succeeds **Roy F. Bennett,** Sohio Petroleum Co., Oklahoma City. Other newly elected officers are **Ben F. Rummerfield,** executive vice-president, Century Geophysical Corp., Tulsa, vice-president; **Howard E. Itten,** president, Empire Geophysical, Inc., Ft. Worth, secretary-treasurer; and **Dr. L. Y. Faust,** Amerada Petroleum Corp., Tulsa, editor.

O. C. Clifford, Jr.

R. Shaver

REX SHAVER has been appointed assistant to the president of Rimrock Tidelands, Inc. In this position, he will coordinate contract drilling activities and serve as the president's representative in the Gulf Coast area, with headquarters in New Orleans. In 1948, Shaver joined Big Chief

Drilling Co. of Mississippi, and affiliated companies as a contract representative. He later became vice-president of one of the affiliates, H. L. Rowley, Inc., advancing to executive vice-president in 1955, and to president in 1956.

JOSEPH WALLA, JR., has joined Northern Natural Gas Producing Co. as district geologist at Calgary. The company is a subsidiary of Northern Natural Gas Co. Walla was formerly associated with Creole Petroleum Corp. for approximately 10 years, in Venezuela.

J. Walla, Jr.

B. J. Lancaster

B. J. LANCASTER is the new resident engineer for Atlantic Refining Co.'s engineering and construction department in Dallas. He will have charge of the department's southwest and Venezuelan sections. Lancaster, a native of Longview, Tex., succeeds the late **Darcy W. Henwood.** Prior to his appointment, he was field group supervisor for the engineering and construction department's southwest section.

TULIO FEBRES-CORDERO will head the newly established consular office of the Venezuelan government in Dallas. The office will handle an increasing volume of business, dealing principally with the petroleum industry, and travel between the Dallas area and the South American country. Cordero, a career consul, has held prior U. S. posts at New Orleans and Miami.

RUSSELL E. HAYWARD is the new chief geologist for Canadian operations, in Calgary, of Alex W. McCoy Associates, Inc., petroleum consultants. He was formerly assistant zone exploration manager for Gulf Oil Corp., in Oklahoma City.

ROBERT D. HAACK will be superintendent of the new Standard Oil Co. (Ind.) terminal at Escanaba, Mich. **Earl R. Swett** replaces Haack as superintendent at the Milwaukee terminal. **Dwight Browning,** district pipelines superintendent at Chicago since 1955, succeeds Swett as superintendent at Peoria, Ill.

EDWARD W. LANG, vice-president, marketing department of Cities Service Oil Co., New York, has been named chairman of the petroleum division of the Muscular Dystrophy Assn. of America, Inc.

JESS L. WARREN has been appointed secretary-treasurer of Shelton-Warren Oil Co., Roswell, N. M. He will direct a major part of the company's exploitation of oil properties in New Mexico and in the western part of Texas. Earlier this year, Warren formed a partnership with **Bill A. Shelton,** which evolved into the present company, with Shelton as president.

EARNEST E. CAMPBELL has been promoted to assistant superintendent of Magnolia Petroleum Co.'s natural gas department, in Dallas. With Magnolia for 28 years, he was most recently district superintendent at Morgan City, La., where he directed Gulf of Mexico gas operations. **James A. Upton** will take over Campbell's Morgan City post. **Charles A. Freeman,** assistant superintendent of the Pegasus district near Midland, transfers to Fremont, Tex., as Seeligson district superintendent, replacing Upton. Freeman will be succeeded at Pegasus by **Donald L. Nichols,** formerly of Healdton, Okla.

FRITZ K. JOHNSON has joined Pan American Petroleum Corp. as junior geologist at Oklahoma City.

JOHN B. RUSHMER has joined the employee relations department of International Petroleum Co., Ltd., in Coral Gables, Fla. Since 1955 he has been personnel research superintendent of the Iranian Consortium's operating companies.

WARREN L. TAYLOR has been named chief geologist for El Paso Natural Gas Co., El Paso, Tex. **James G. Wilkins,** formerly assistant superintendent replaces Taylor as exploration superintendent of the Salt Lake division.

WILLIAM HILL, JR., vice-president of Dillon, Reed & Co., New York, has been elected a director of Falcon Seaboard Drilling Co., Tulsa. He has been with Dillon, Reed since 1926, except for the period 1942 to 1946 when he was a board member of Navy Price Adjustments in Washington.

W. Hill, Jr.

J. S. Wintringham

JOHN S. WINTRINGHAM has been named to the newly created post of senior research advisor of Ethyl Corp.'s research laboratories in Detroit. With the company since 1930, he has held many key supervisory and engineering positions in the research organization. In his new position, Wintringham assumes many of the former responsibilities of **J. B. Macauley,** who has resigned to serve, in Washington, as deputy assistant secretary of defense for research and engineering. Other appointments to the technical service division of the Detroit laboratories are **T. J. Wilkinson,** assistant supervisor of the passenger car and accessory section; **H. M. Smith,** engineer in the engineering services section; and **G. E. Saxon,** technical assistant to the director of the division.

J. CLARK NEWSOM has been named manager of marketing, retail and distributor sales, of Crown Central Petroleum Corp., Baltimore, Md. He was formerly associated with the sales and marketing department, and later the economic planning division of Gulf Oil Corp., Pittsburgh.

J. C. Newsom

J. W. Sinclair

JOHN W. SINCLAIR will become general manager of marketing for India, Burma, and Ceylon, in Bombay, of Standard-Vacuum Oil Co. He succeeds **James V. Hanlon,** who is retiring at the end of the year. **Robert R. Kendall,** financial adviser to Stanvac's general representative in London, is replacing Sinclair as financial and accounting coordinator, in Bombay.

WARREN SCARBOROUGH, an attorney with Cantey, Hanger, Johnson, Scarborough, and Gooch, has been elected a director of the First National Bank of Ft. Worth. He is also a director of Mid-Continent Supply Co., Collier Industries, Champlin Oil & Refining Co., Loffland Bros., and Great Western Drilling Co.

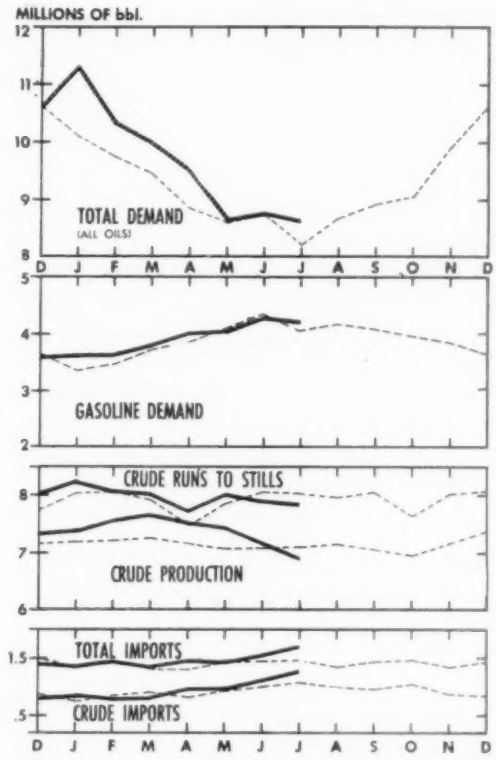
S. GOLDIN will become manager of marketing operations for Shell Oil Co., New York, when **P. W. Engels** retires in mid-1958. **R. L. Geraghty,** manager of the marketing administrative office, will succeed Goldin as administrative assistant to the general manager of marketing. **J. C. Drager** has been made land agent for Shell Oil Co., Calgary. He was formerly land manager in Edmonton.

SINCLAIR OIL & GAS CO. has transferred three operating personnel from its Houston division to Sinclair's Venezuelan affiliate, Sinclair Oil & Refining Co. They are **Oscar C. Holmes,** production; **Leroy D. Lane,** petroleum engineer; and **John W. Logan,** warehouseman. All are currently stationed in eastern Venezuela.

LeROY B. FOX will manage the asphalt department of Socony Mobil Oil Co., New York, succeeding **George R. Christie,** who retires shortly. Fox will be succeeded as manager of the fuel oil division of the gasoline and fuel oil department by **Leonard S. Marshman.** He formerly managed the crude oil division of Mobil Overseas Oil Co.'s distribution department.

PETROLEUM WEEK'S

Fingertip Figures



TOTAL DEMAND
Latest week average 8.647
Year ago 8.416

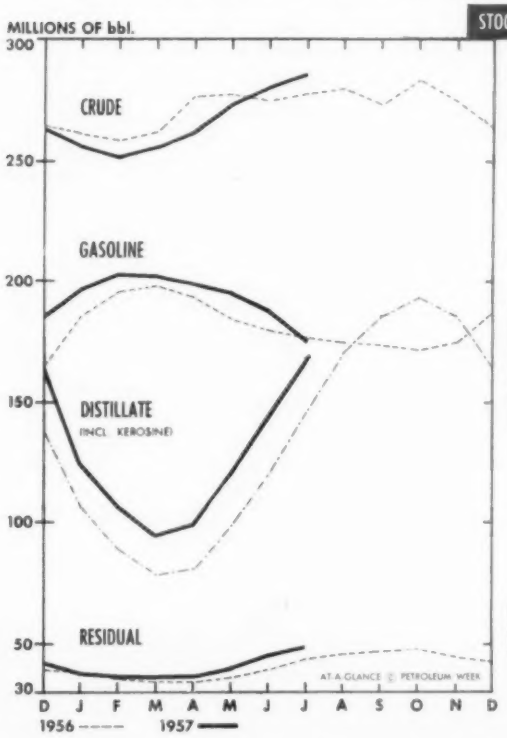
GASOLINE DEMAND
Latest 4-week average 4.168
Year ago 4.044

RUNS TO STILLS
Latest week 7.970
Previous week 7.968
Year ago 7.943

CRUDE PRODUCTION
Latest week 6.788
Previous week 6.837
Year ago 7.127

TOTA LIMPORTS
Latest week 1.610
Previous week 1.610
Year ago 1.488

CRUDE IMPORTS
Latest week 1.255
Previous week 1.236
Year ago 1.082



CRUDE STOCKS
Week-ended 8-17 286.6
Previous week 284.4
Year ago 277.1

GASOLINE
Latest week 171.9
Previous week 172.1
Year ago 176.8

DISTILLATES
Latest week 182.9
Previous week 179.7
Year ago 165.9

RESIDUAL
Latest week 52.2
Previous week 50.9
Year ago 46.1

Sharp upward climb in stocks of crude since the Suez crisis has carried inventories to the highest level since the close of 1938.

But at the present level of 286,618,000 bbl., crude in storage still is far short of the all-time high. The record is 428,445,000 bbl., established at the end of 1929.

However, the present level of 286,618,000 bbl., is greater than any crude inventory total since the 291,452,000 bbl. held in 1938.

Nearest approach to today's high crude storage figure was that existing in October, 1956, immediately preceding the Suez crisis.

The total then was 286,560,000 bbl. But where the Suez crisis brought a heavy draft on U.S. crude stocks, there isn't anything on the horizon that points toward lowering the present level—at least, not to the extent of the 36-million bbl. of crude which were taken out of storage to help fuel the needs of western Europe during the Suez emergency.

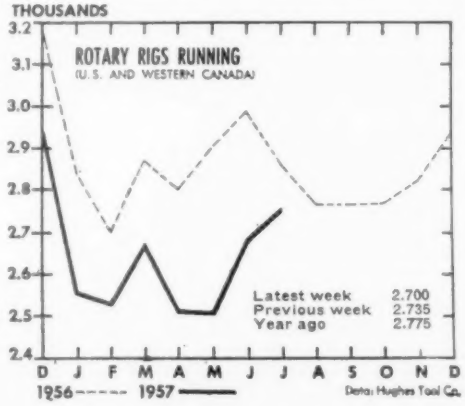
In February, domestic stocks had been lowered to 250.5-million bbl. But now, six months later, crude stocks are even higher than when the canal was closed.

Talk of reduced refinery runs will aggravate rather than help the crude inventory situation.

This is especially true in the light of statements made by various state regulatory officials that allowables will not be cut back any further.

This means that domestic production will continue at approximately the present rate, and that as refinery runs go down, the surplus of crude will increase. The only place the oil can go is to storage.

The end result will be even higher levels of crude stocks until the voluntary imports plan actually becomes effective.


THOUSANDS
ROTARY RIGS RUNNING
(U.S. AND WESTERN CANADA)
Latest week 2.700
Previous week 2.735
Year ago 2.775
D J F M A M J J A S O N D
1956 ----- 1957 ——
Data: Hughes Tool Co.

The Market Trend

Area by Area, Gasoline Looks Different

The situation on gasoline varies sharply by regions. It's almost as if you were talking about different products in different areas.

The firmest spot this week is the Upper Midwest. Summer refinery strikes and good late-season demand have pulled stocks down in the area served by the Great Lakes Pipe Line. Last week, a major sold 100,000 bbl. of regular-grade along the line, but found he was able to come up with only 60,000 bbl.

The tighter position along the line encouraged some Mid-Continent refiners to raise prices 0.25¢ a gal. As harvest crews work northward, good gasoline demand is expected to continue for the next two months.

Gulf Coast refiners wish that they, too, could quote—and get—higher prices for gasoline. But expected late-season cargo buying has failed as yet to materialize. The pressure of crude oil inventories has some refiners operating at higher rates than they expected. The result: Some refiners who were on the verge of buying now are standing pat.

In the East, there seems to be a rage to sell gasoline regardless of price. In many cities, retail prices (ex tax) were substantially lower than cargo-lot quotations at the Gulf. Regular-grade in Hartford, Conn., was selling as low as 6.9¢ for tank wagon deliveries. At Providence, R. I., tank wagon prices generally were 9.9¢ (ex tax). In Pennsylvania's Wyoming Valley, most marketers posted 14.6¢ tank wagon, and then granted dealers allowances up to 8¢.

No. 2 Fuel—Suppliers Seem Tense:

Look for a lot of scare talk on distillates between now and cold weather. This week, New York harbor was unsettled by reports that Long Island barge buyers were getting q.t. 0.2¢ discounts on No. 2 fuel.

Word was getting around Philadelphia that one refiner was eager to move surplus No. 2 fuel at 9¢, delivered by ship to New York. Another seller there quoted a barge buyer on a cargo-lot basis—in other words, he cut the price by 0.45¢ for contract sales.

A Gulf Coast refiner is reported very long on distillates. The reason: He swapped a lot of gasoline for crude oil. This makes his gasoline position fine, but leaves something to be desired on No. 2.

For Texans—An Old Complaint:

A cargo shipment of crude was arranged last week which will set teeth on edge in Texas. A T2 was fixed for Kuwait-to-Houston shipment at $4.37 a ton (USMC—70%).

Assuming the posted Kuwait price of $1.85 a bbl. for 3-gravity, Middle East crude can hit Houston at about $2.56 a bbl., including duty. This price is 28¢ a bbl. lower than the field price for comparable oil in West Texas.

A Penny Saved . . . .

The Indian government figures it will save about $4.2-million a year by swinging from a U.S. Gulf to Persian Gulf basis on purchases.

Late this spring, Persian Gulf refiners started public posting of products in cargo lots. Most of the prices are about 0.25¢ lower than U.S. Gulf quotations.

The Market Place

AROUND THE WORLD

Prices compiled for PETROLEUM WEEK by Platt's OILGRAM Price Service and National Petroleum News, McGraw-Hill Publications

All Prices as of August 28

Bold face type indicates changes from previous week

KEY PRICES—REFINED PRODUCTS

(¢ per gal. except dollars per bbl. where $ is shown)

Western Hemisphere

U.S. Gulf Coast, cargoes
- Gasoline, 98 oct prem. 13.25-14.375
- Gasoline, 92 oct reg. 11.5-12.625
- Kerosine 9-11
- Heating oil, No. 2 ..... 9-10.5
- Gas oil, 48-52 d.i. 9.25-10.625
- Fuel oil, bunker "C" $2.55-3.15

Caribbean, cargoes
- Avgas, Grade 100/130 ..... 17.5
- Gasoline, 93 oct research prem. 11.75
- Gasoline, 87 oct research reg. 10.875
- Gasoline, 79 oct research 10.125
- Gasoline, 70-72 oct motor method 9.75
- Kerosine 9.25
- Heating oil, No. 2 9
- Gas oil, 48-52 d.i. 9.25
- Fuel oil, bunker "C" $2.55

New York Harbor, barges
- Kerosine 10.75-11.25
- Heating oil, No. 2 ..... 10.25-10.75
- Fuel oil, No. 6 ..... $2.95

Okla-Group 3, northern, shpt, bulk
- Gasoline, 89 oct reg. 11.75-12.25
- **Kerosine ..... 10↓-10.875**
- **Heating oil, No. 2 ..... 9↓-10.25**
- Fuel oil, No. 6 ..... $2.05-2.15

Chicago, bulk
- Gasoline, 91 oct reg. 13-13.8
- Heating oil, No. 2 ..... 9.5-10.65
- Fuel oil, No. 6 high sulfur 8.1-8.2

Los Angeles, rack
- Gasoline, 84 oct reg. 13.6
- Diesel fuel, PS 200 ..... 10-11.25
- Light fuel, PS 300 ..... $3.40-3.65
- Heavy fuel, PS 400 ..... $2.85-3.05

Natural Gasoline, Grade 26-70
- FOB Group 3 4
- FOB Breckenridge, Tex. 3.5

LP-Gas
- Propane, Oklahoma (Group) 3.5-5

Penna Lubes
- Bright stock, 25 p.t. 27
- 200 vis. neutral, 25 p.t. 25

Mid-Continent Lubes, Tulsa basis
- Bright stock, solvent, 95 v.i. 25.5-26.5
- Neutral, solvent, 200-210 vis. 21.25-22.25

Gulf Coast Lubes
- Bright stock, solvent, 95 v.i. 26.5
- Neutral, solvent, 200 vis. 23

Eastern Hemisphere

Singapore (Pulau Bukom), cargoes
- Avgas, grade 100/130 ..... 18.625
- Gasoline, 79 oct research 10.5
- Kerosine 10.375
- Gas oil, 48 d.i. minimum 10.375

KEY PRICES—CRUDE OIL

(2¢ differential per deg. of grav. applies except as noted)

Western Hemisphere

United States (at the well)
- Mid-Continent, 36.0-36.9 ..... 3.07
- North Dakota, 36.0-36.9 ..... 3.07
- Texas:
  - Gulf Coast, low cold test, 26.0-26.9 ..... 3.50
  - G. Coast, Upper & Lower, 26.0-26.9 ..... 3.07-3.22
  - West Texas, sweet, 36.0-36.9 ..... 3.07
  - West Texas, N. M., inter., 36.0-36.9 ..... 3.00
  - West Texas, N. M., sour, 32.0-32.9 ..... 2.86
  - East Texas, flat 3.25
  - Mirando, 28.0-28.9 ..... 3.31
- Illinois Basin, flat 3.15
- Pennsylvania Grade, Bradford dist. flat 4.65
- California, Signal Hill, 21.0-21.9 ..... 2.93†
- North Louisiana-Arkansas, 36.0-36.9 ..... 3.20
- Wyoming sweet, 36.0-36.9 ..... 3.00
- Wyoming sour, 32.0-32.9 ..... 2.71

Canada (flat prices, at the well)
- Acheson-Stony Plain (Alta.) 2.72
- Leduc-Woodland (Alta.) 2.78
- Redwater (Alta.) 2.67
- Daly (Man.) 2.50
- Smiley (Sask.) 2.44

Venezuela (Cargoes, FOB lifting port designated)
- Cumarebo ,48.0-48.9, Tucupido 3.75
- San Joaquin, 41.0-41.9, Puerto la Cruz 3.34
- Oficina, 35.0-35.9, Puerto la Cruz 3.05
- Tia Juana, Medium, 26.0-26.9, Amuay 2.55
- Bachaquero, flat, Amuay, Las Piedras 2.23
- Tarra, 38.0-38.9, San Lorenzo 3.08
- Lagunillas Heavy, flat Amuay 3.28
- Cardon 2.20

†Differential per deg. of grav. varies.

Eastern Hemisphere

Middle East, Persian Gulf (Cargoes, FOB lifting port)
- Arabia, 34.0-34.9, Ras Tanura 2.08
- Safaniya, 27.0-27.9, Ras Tanura 1.79
- Iran, 34.0-34.9, Bandar Mashur 2.04
- Iran, 34.0-34.9, Abadan 1.99
- Iraq, 35.0-35.9, Fao 1.98
- Kuwait, 31.0-31.9, Mina-al-Ahmadi 1.85
- Qatar, 41.0-41.9, Umm Said 2.23

Middle East, Eastern Mediterranean
- Arabian, 36.0-36.9, Sidon 2.69
- Iraq, 36.0-36.9, Tripoli, Banias 2.69

Far East, Cargoes, FOB Lutong, Sarawak
- Seria Light, 37-38 ..... 2.75

KEY TANKER RATES

(Last paid, per long ton, single voyage)

- U.S. Gulf-N.Y., clean ..... (USMC —30%) $2.00
- **U.S. Gulf-N.Y., dirty ..... (USMC —37½%) $1.78↓**
- **NWI-USNH, dirty ..... (USMC —65%) $0.95↑**
- NWI-UK/Cont., dirty ..... (Scale —30%) 22/9*
- Pers. Gulf-UK/Cont., dirty ..... (Scale —32½%) 38/7*
- Persian Gulf-USNH, dirty ..... (USMC —50%) $6.35

**Sterling*

ADVERTISERS IN THIS ISSUE

Baker Oil Tools Inc.	18
Continental Oil Co.	23
Crose Mfg. Co., M. J.	35
Davison Chemical Co.	33
Dowell, Inc.	Cover 4
Electromotive Div., GMC	24-25
Engineered Oil Tools, Inc.	32
Ethyl Corp.	17
Ethyl Corp., Chem. Div.	1
Foster Wheeler Corp.	8
General Electric Co., Ind. Electronics	4
Hercules Tool Co.	26
Jones & Laughlin Steel Corp.	37
LeTourneau, Inc., R. G.	15
Lone Star Steel Co.	Cover 3
Milwhite Mud Sales Co.	39
National Supply Co.	27-30
Servco	7
Shell Chemical Corp.	Cover 2
Thermoid Co.	3
Tidewater-Va. Develop. Council	38
U. S. Rubber Co.	13
Vogt Machine Co., Henry	40
Youngstown Sheet & Tube Co.	2

PROFESSIONAL SERVICES 55

CLASSIFIED ADVERTISING
F. J. Eberle, Business Mgr.

BUSINESS OPPORTUNITIES 55

PETROLEUM WEEK REPRESENTATIVES

Atlanta 3 Douglas C. Billian
1301 Rhodes-Haverty Bldg.
Jackson 3-6951

Boston 6 Edward A. Callahan, Jr.
350 Park Square Bldg.
Hubbard 2-7160

Chicago 11 W. F. Holbrook
520 North Michigan Avenue
Mohawk 4-5800

Cleveland 15 J. E. MacArthur
1510 Hanna Bldg.
Superior 1-7000

Denver 2 J. W. Patten
Mile High Center, 1740 Broadway
Alpine 5-2981

Houston 25 D. O. Hanson
724 Prudential Bldg.
Jackson 6-1281

Los Angeles 17 Peter S. Carberry
1125 W. Sixth St.
Madison 6-9351

New York 36 Edward A. Callahan, Jr.
Donald R. Thompson
500 Fifth Ave.
Oxford 5-5959

Philadelphia 3 W. A. Potter
Architects Building
Rittenhouse 6-0670

San Francisco 4 William C. Woolston
68 Post Street
Douglas 2-4600

Tulsa 19 J. A. Hartley
209 Constantine Bldg.
611 South Boston
Gibson 7-5594

England, London E. C. 4 Herbert Lagler
McGraw-Hill Co., Ltd.
95 Farringdon St.

DEPT/Service & Equipment Companies

J. D. Gilmer

A. M. Thompson

F. C. Stickney

J. D. GILMER, A. M. THOMPSON, and **F. C. STICKNEY** have been appointed store managers for Mid-Continent Supply Co., in Great Bend, Kan., Laurel, Miss., and Eunice, N. M., respectively. Gilmer was formerly a city salesman at Great Bend; Thompson and Stickney were field salesmen at Citronelle, Ala., and Hobbs, N. M., respectively. The company also has promoted **E. J. Kreyenbuhl,** field salesman at Odessa, to city salesman at that location. Seven new field salesmen are **H. R. Blakemore,** Magnolia, Ark.; **J. T. Cloyd,** Kermit, Tex.; **G. E. McHugh,** Odessa; **M. B. Parker,** Laurel; **R. W. Ramey, Jr.,** Hobbs; **J. L. Reed,** Sundown, Tex.; and **R. O. Womack,** Shreveport, La.

ROBERT KEMP will head a new office in Tulsa for Benson-Lehner Instrument Corp., manufacturer of data reduction and curve plotting systems in exploration, transfer, and refinery operations. He has had five years of seismic, gravity, and geophysics experience with Humble Oil Co.

C. D. McIVER will manage the newly opened district office at Farmington, N. M., for Mid-Continent Supply Co. **H. T. Branum** is manager of the supply store located in the new building.

GREGG C. HILTON has been appointed sales manager, and **Jim Kennedy** and **Lowell Light** sales and service representatives in Odessa, for Sivalls Tanks, Inc., tank and equipment manufacturer. Hilton joined the company in June, 1957, after working two years as a special representative for B. F. Walker, Inc., trucking contractor with offices in Ft. Worth. Kennedy was formerly a sales and service representative for Sivalls in the Crane-McCamey-Iraan-Ft. Stockton-Monahans territory; Light joined Sivalls as a trainee in March, 1957, and is now assigned to the Big Spring-Snyder-Colorado City-Lubbock territory.

TOM BARNARD, ELMO MORRISON, and **DON WHITE** have joined Allan Edwards, Inc., Tulsa engineering firm, as sales engineers. Barnard was formerly with Warren Petroleum Corp. and Aljo Sales, Inc.; Morrison was a sales manager for a California industrial company; and White was with National Tank Co. and Douglas Aircraft Co.

BRAD KEYES, formerly with the New Mexico Oil Conservation Commission, is the new president of Geolectric, Inc., Aztec (N. M.) independent service company operating in the Four Corners area.

ROBERT S. GAUDIN is a new sales engineer for Delta Mfg. Co.'s oilfield equipment division, in Lafayette, La. He was formerly associated with the production department of Humble Oil & Refining Co., and Warren Petroleum Co.

AVONDALE MARINE WAYS, INC., has expanded its facilities with the addition of an all-new machine shop at the River plant at Avondale, La., and the purchase of new and special-order production tools. This Louisiana company serves the marine, petroleum, chemical, sugar, and other industries.

CLIFFORD A. FAUST has been appointed director of technical service for Consolidated Electrodynamics Corp., Pasadena, Calif. He succeeds **Harold F. Wiley,** recently named director of the company's analytical and control instruments division. Faust had been assistant director of technical services since April, 1957. **Robert D. Ridgway** is the newly appointed manager of sales operations. He was formerly assistant manager of this department.

C. A. Faust

F. E. C. Jenkins

FREDERICK E. C. JENKINS is transferring to The Hague, Holland, as technical service engineer of the European division of Petrolite Corp., manufacturer of demulsifiers and corrosion inhibitors. He formerly was assistant manager of technical services in St. Louis for Petrolite.

HARRISBURG SALES & SERVICE, INC., Ft. Worth, manufacturer of oil field specialties, has formed three new sales districts at Houston, Odessa, and Houma, La. Appointed to head the new Houston sales district is **R. T. Stewart**, former district manager at that location. **Jack Floyd** has been promoted from sales engineer to South Louisiana district manager, and **T. E. Nesky** will head the West Texas district. Nesky formerly was sales representative in Odessa. **E. O. Hudnell** advances from field salesman at Houston to sales engineer at New Iberia, La. **W. E. Smith** is a new salesman at Andrews, Tex., and **J. A. Brookman** is field salesman in North Texas, southern Oklahoma, and the Panhandle, with headquarters in Oklahoma City.

ALLEN STAUB will manage the newly opened Dallas district office of Mountain Iron & Supply Co. **Lee DeWeese** will be in charge of the new sales office at Perryton, Tex.

RAY E. LEVERICH, former manager of Anderson-Prichard Oil Corp.'s tax division, has joined the George E. Failing Co., Enid, Okla., as director of finance and taxes.

JOHN J. GLOVER will manage the newly formed commercial development division of Jefferson Chemical Co., in Houston. He was formerly manager of market research. The new division is a consolidation of the old market research, and sales research and development divisions.

LOWELL S. BRANSFORD is the new production supervisor, and **DOW E. SLAGLE** purchasing agent at the Gainesville (Tex.) plant of National Supply Co. Bransford has been purchasing clerk since 1955; Slagle has served as purchasing agent for American Mfg. Co., Ft. Worth, for about five years.

F. Brechtel

P. Fuenning

FRED BRECHTEL and **PAUL FUENNING** are newly appointed vice-presidents of Geophoto Services, Ltd., Calgary. Brechtel, with the company since 1949, will be in charge of general administration and client relationship. Fuenning, with the firm since 1946, will handle geological operations.

PAT HENRY will manage sales promotion for Schramm, Inc., West Chester, Pa., manufacturer of industrial compressed air equipment. He replaces **George B. Comfort**, who has been assigned to a special project. Henry had been sales promotion manager of Willson Products division, Ray-O-Vac Co., Reading, Pa., for several years.

E. C. ZOGRAFOS will manage advertising and sales promotion for Baash-Ross Tool Co., Houston division of Joy Mfg. Co. He was formerly assistant advertising manager. **R. C. Brenner**, company representative in the Shreveport (La.), Rocky Mountain, Dallas, and Houston areas, has been promoted to Gulf Coast area sales manager, in Houston. **Fred Waller** will represent the company in the east Texas area, with headquarters in Houston.

R. M. HAYNIE is transferring from Greggton, Tex., to Shreveport, La., as manager of Perforating Guns Atlas Corp.'s new district office. The company also has opened five new stations. Newly assigned to the stations are **Lee Buel**, from field engineer at Houma, La., to head of the new Buras (La.) station; **J. E. Crouch**, from field engineer at Lafayette, La., to head of new Magnolia (Ark.) station; **John S. Rhodes**, from the Odessa station, to district manager of new Farmington (N.M.) station; **W. E. McCarroll**, from salesman at Odessa, to the new station at Crane, Tex.; **James H. Rodgers**, from district sales representative at Victoria, Tex., to district manager of the new Laurel (Miss.) station. Newly assigned district manager of the company's Pampa (Tex.) station is **Charles B. Melvin**, formerly district sales representative at Graham, Tex.

CHARLES H. ATWOOD is the new president of Union Carbide Caribe, Inc. The company, a subsidiary of Union Carbide Corp., will operate the new petrochemicals plant under construction near Ponce, Puerto Rico, which will produce ethylene oxide and derivatives. Since 1945, Atwood has been superintendent of the Institute (W. Va.) plant of Union Carbide Chemicals Co., a division of the corporation.

JERRY RUSHMORE is to be the new sales engineer for the Odessa (Tex.) district of Welex Jet Services, Inc. With the company for 4½ years, he has served in the Hobbs (N.M.) and Pampa (Tex.) districts.

THE NOMADS, Houston chapter, played hosts to a group of foreign oil men at their recent August meeting. Guests at the meeting included (seated l. to r.) **E. S. Hulsman**, Shell Oil Co., Bogota, Colombia; **J. T. Johnson**, Creole Petroleum Corp., Maracaibo, Venezuela; **Chester H. Lauck** (Lum of Lum & Abner), Continental Oil Co., Houston; (standing, l. to r.). **R. R. Davila**, consul general of Venezuela, Houston; **R. Ach**, S. N. Marep, Paris; **R. H. Johnson**, Standard-Vacuum, Polembang, Sumatra; and **Oscar Schuberg**, Caltex, Sumatra.

CLASSIFIED

DISPLAYED RATE

The advertising rate is $12.60 per inch for Equipment and Business Opportunity advertising appearing on other than a contract basis. Contract rates quoted on request. Employment opportunities—$17.05 per inch, subject to Agency Commission.

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$1.50 a line. Minimum 3 lines. To figure advance payment count average words as a line. (See ¶ on Box Numbers.)

POSITION WANTED. Undisplayed rate is one half of above rate payable in advance.

PROPOSALS, $1.50 cents a line an insertion.

INFORMATION

BOX NUMBERS count as one additional line in undisplayed ads.

FREE BOOKLET

If you are a $5,000-to-$20,000 investor you should have our free folder. What Is A Royalty, for higher monthly income than possible elsewhere. Address Operator Box 2153, Denver, Colorado. No stocks for sale. Banking references.

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Phone KE 9595
604 A Second St. West
Calgary, Canada
Phone AMherst 64523
Cable: PETROGEO

AS THE EDITORS SEE IT

Yocom Waved a Banner of Facts

SHORTLY BEFORE HIS DEATH (page 10) Herb Yocom wrote his last story. It was an elementary explanation of the oil depletion provision, and was published in PETROLEUM WEEK July 12.

Herb's story neither defended nor attacked the depletion provision. Rather, it was an effort to explain the provision and how it works. This approach demonstrates a key point of Herb's basic philosophy:

He did not consider himself a "defender" of the oil industry. Instead, he felt it was his duty as an oil journalist and as a person keenly interested in the industry, to present an accurate picture of existing conditions. Personally, he deeply believed that oil's record has been a good one, but he left it to his readers to reach their own conclusions—based on facts.

HERB FELT STRONGLY that information and understanding, not bias or breast-beating, form the basis for real industry progress. This was the underlying reason for his heavy emphasis on the need for "integrated" oil men—men with a broad knowledge and understanding of the industry as a whole rather than just one part of it.

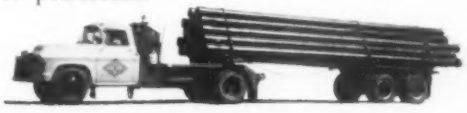
Herb is gone, and PETROLEUM WEEK's heart is at half-staff. But much of Herb's philosophy and influence will live with the industry for a long time.

Congrats and $25 to LOCKWOOD H. POOL, 424 Shell Bldg., New Orleans, La., for this quip.

"..thinks a female connection is a steady date."

The oil country has a whopping big appetite for pipe. Lone Star Steel's huge plant was built for the specific purpose of supplying fully normalized *API casing, tubing and line pipe* to Joe Roughneck, heart of the oil and gas industry. As fast as we can make it, he gets it!

Now . . . we're building again . . . our new stretch-reducing mill and another open hearth furnace. Goal: more fine steel and more pipe . . . to help Joe meet the greater domestic and export demand for petroleum.



Neighbor, wherever you are, specify Lone Star and we both get a good deal.

Lone Star STEEL
COMPANY

LSS

EXECUTIVE SALES OFFICES
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Midland, Texas
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Dowell-developed rubber tanks provide large-volume storage for big frac jobs.

This kind of *service* keeps Dowell out in front!

There are many ways to describe "service."

Dowell does it by continually introducing new equipment, materials and methods to lower costs and to improve the producing characteristics of your wells.

For instance, Dowell developed collapsible rubber tanks, and was the *first* to introduce Polyethylene lining for earthen tanks. These two developments provide suitable storage for large quantities of well treating fluids where terrain or trucking regulations limit the use of steel tanks. They also help you cut storage costs on any large-volume job, and often save valuable rig time . . . this means better service.

To stay a step ahead of field problems, Dowell has invested heavily in laboratory equipment and facilities. Dowell was the *first* oil field service company to equip its laboratory with the rare Electron Microscope, enabling Dowell technicians to "see" your problems more clearly than ever before possible. Translated—better service.

And Dowell was *first* to apply aircraft power—in the form of the Allison engine—to formation treating. This mighty pumper is especially useful in high-injection-rate fracturing. This is what we call service.

At Dowell good "service" is everyone's job. You get what you expect from Dowell—and more. Dowell Incorporated, Tulsa 1, Oklahoma.

Services for the oil industry DOWELL

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